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Lt. Arnold S. Rosenwald

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THE HOMING PIGEON

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TECHNICAL MANUAL
No. 11–410

WAR DEPARTMENT,
WASHINGTON, *September 10, 1940.*

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THE HOMING PIGEON

Prepared under direction of the
Chief Signal Officer

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SECTION I

GENERAL

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1. **Purpose.**—The purpose of this publication is to provide the information and instructions necessary for the proper breeding, care, and training of the homing pigeon and for the proper selection and training of enlisted pigeon personnel. The necessary information and instructions for units which use the homing pigeon in pigeon communication, including receiving, caring for, and releasing the pigeon, as contained in FM 24–5, are not repeated in this manual. Matters regarding the employment of pigeon communication are included in FM 11–5 and those regarding the employment of the pigeon company are included in FM 11–20. The information and instructions contained herein are equally applicable, with certain modifications, to pigeon units and establishments serving the field forces, to those in the zone of the interior, and to those maintained in peace.

2. **Methods.**—The methods and procedures prescribed herein are based upon experience but due to the nature of the homing pigeon, cannot be considered as final. Accordingly, all military personnel are

* This pamphlet supersedes TR 1255–1, October 30, 1936.

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enjoined to submit recommendations to the Chief Signal Officer relative to improvements in all matters affecting pigeon communication which have been found through experience or personal research to warrant study and consideration for adoption.

3. Origin.—*a.* The homing pigeon used by the Army in pigeon communication is the result of several centuries of intelligent cross-breeding between various strains derived originally from the bizet or rock pigeon. This crossing, which was made with the most perfect specimens of each strain, has produced a variety of the pigeon family noted for its superior physique and homing ability.

b. While the "carrier pigeon" is an entirely distinct species of pigeon, larger than the homing pigeon, with large wattles and eye ceres, bred for show purposes, custom and usage have frequently designated the homing pigeon by the term "carrier pigeon." To avoid confusion of terms and to secure a correct nomenclature, the terms "homing pigeon," "pigeon," and "bird" are used synonymously in this manual for the homing pigeon employed by the Army.

4. Nature.—The nature of the pigeon is such that if removed from its home loft and released, it will try to return thereto, even with an attached message or other light article. Its desire to return to its loft is largely based on the natural urges of hunger and reproduction, and being monogamous, the latter urge may often be made greater than the former. By proper feeding, mating, and breeding, and the deprivation thereof at certain periods, these urges are stimulated to the greatest extent possible without endangering the pigeon's physical condition.

5. Utility.—The pigeon's usefulness to the Army is measured by the reliability and speed with which it returns to its loft. Its ability in regard to reliability and speed is determined largely by its strain, physical condition, training, and treatment. Inadequacies in any of these seriously affect this ability. Other detracting influences are mentioned in *e* below. Minimum ability standards for well-bred birds in excellent physical condition which have been properly trained and treated are indicated in Section V. These standards assure that pigeons distributed to combat units are able to meet all the requirements for pigeon communication in those units.

a. Breeding.—Since physical characteristics of the pigeon are generally inherited from its parents, and since its homing instinct is usually so inherited, records of each pigeon are carefully kept. Based upon such records, pairs are selected, mated, and allowed to produce young birds having the most desirable attributes. (See sec. VI.)

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b. Condition.—The physical condition of a pigeon influences its performance to such an extent that its physical characteristics are studied, and procedures for feeding, watering, and otherwise maintaining it in a proper physical condition for military use are rigidly enforced. (See secs. III and VII.)

c. Training.—Training of the pigeon begins at an early age, is progressive, constant, and is devoted to the sole purposes of settling the pigeon in its home loft and developing the reliability and speed of the bird to the utmost. (See sec. V.)

d. Treatment.—The pigeon is highly sensitive and responsive to treatment. Of great importance in this respect are kindness, firmness, and calmness of the personnel handling it, and the reward given the pigeon for good performance. The pigeon prizes its home, and every effort should be made to increase the attractiveness thereof by proper loft construction, management, and the maintenance of buildings and grounds. (See sec. IV.)

e. Detracting influences.—In addition to inadequacies in the matters mentioned in *a* to *d* above, the efficiency of pigeons may be reduced by the weather, darkness, and injury.

(1) *Weather.*—Fog, snow, rain, and adverse winds, or any other conditions of the weather which reduce visibility or oppose the flight of the pigeon, decrease its efficiency.

(2) *Darkness.*—In general, darkness impedes the flight of any pigeon. Those which have not been trained to fly at night may cease flying entirely during utter darkness, and those which have been trained as night flyers do not usually cover distances as fast as those which fly only in daylight. Since flying ability is rapidly impaired if the pigeon is used both for night and for daylight flying, those trained for night flying are not used for day flights if it can be avoided.

(3) *Injury.*—Most common injuries are those caused by improper handling, predatory birds (such as hawks), by shooting at the hands of hunters or the enemy, and by striking obstacles in poor weather or darkness. Hawks in the vicinity of lofts are destroyed, and as much protection as is possible is afforded the pigeon from the enemy and obstacles by selecting proper locations for release of the pigeon. If not beyond the limit of the pigeon's ability to determine its proper course of flight, minor injuries rarely prevent arrival at the loft. If more vitally injured, it continues its return journey in flight or on the ground, if unable to fly, until physically exhausted. In general, any injury which permanently impairs the

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eyes, ears, or wings of a pigeon makes the bird unsuitable for further employment except possibly for breeding purposes.

SECTION II

DESCRIPTION

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6. Appearance.—Figure 1 shows in outline the general appearance of the pigeon with the principal parts indicated. In this figure the right wing is extended for ease of description.

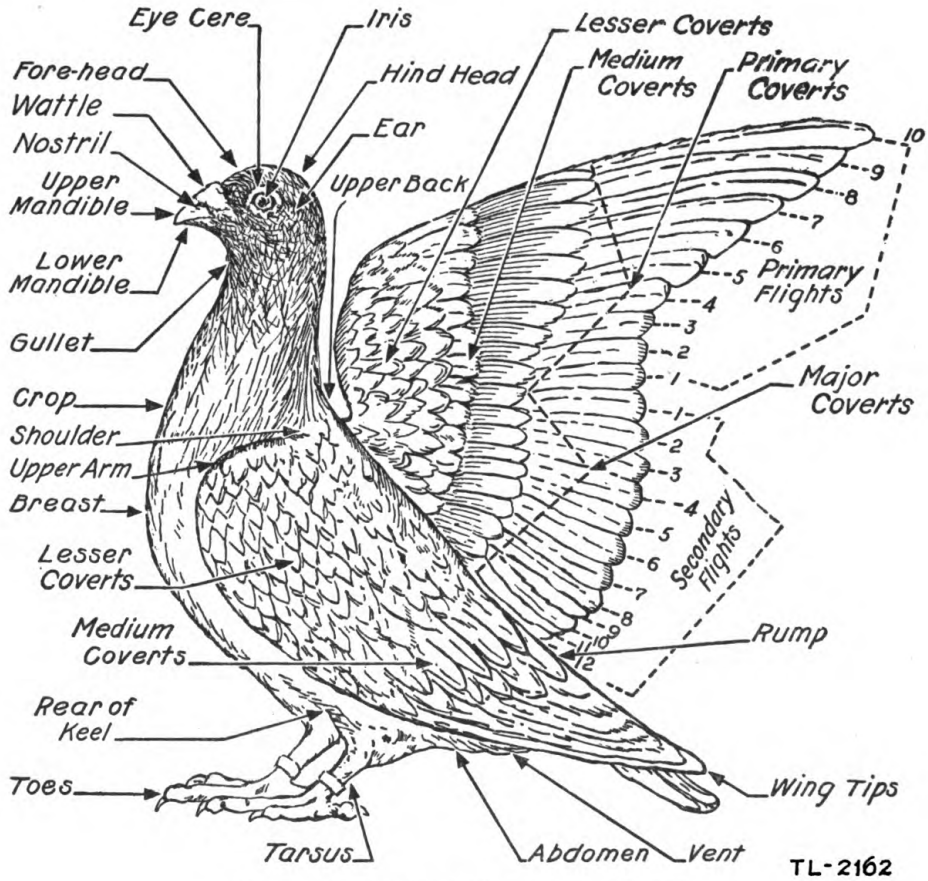

FIGURE 1.—Parts of the homing pigeon.

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7. Weight.—The weight varies from 15 to 18½ ounces for a cock and from 13½ to 17 ounces for a hen.

8. Plumage.—The plumage is rich, abundant, and soft over the whole body. The color is of no importance, but good, rich coloring of any shade, with the checkered pattern (if present) standing out brightly and distinctly, is usually an indication of good health and satisfactory condition. For a classification of pigeons according to color, see paragraph 24.

9. Head.—The shape of the head is convex. The forehead is developed on both sides and the back of the head is deep and wide.

a. Bill.—The bill is strong and deep set.

b. Eye.—The eye is complex and about the same as found in all flying birds. Great mobility in every direction is assured by six muscles. In addition to the two ordinary lids, there is a third lid consisting of a transparent membrane called the eye cere which covers the eyeball from front to rear. This eye cere protects the eye during flight without closing it. The iris is the thin colored curtain stretched vertically across the eye in front of the crystalline lens. It contains the opening called the pupil. The eye can be focused for long or short vision by means of an accommodation muscle which controls the dilation and contraction of the pupil, and by means of ciliary muscles situated in the globe of the eye which effect adjustments of the crystalline lens for vision at different distances. The pupil is said to be dilated when its size is increased or spread out, and contracted when its size is decreased or drawn together. The peculiar structure of the eye, the remarkable play of the accommodation muscle, and the ciliary muscles of the pupil and the crystalline lens give the pigeon great power, clearness, and penetration of sight. The following qualities are apparent in the eye of a first-class specimen of homing pigeon: The blinking is rapid; the action of the ciliary muscles is quick and strong; the pupil is very brilliant and appears to be placed slightly in front of the iris. The latter, well encircled by the membrane of the eye, is very deep in color and quite brilliant.

c. Ear.—The ear appears to play an important part in the sense of direction. It includes three parts, the external ear, the middle ear, and the inner ear. At the top of the inner ear there are three semicircular canals which appear to be the nerve conductors of orientation. It is possible that their great sensitiveness enables the pigeon to perceive magnetic and atmospheric impressions, and to determine the direction of the loft, either at departure or during the flight, when on account of atmospheric disturbances the bird has temporarily lost its way.

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Experience proves that any derangement or unsound or sickly change in the structure of the ear, whatever the cause thereof, destroys the sense of direction.

10. Neck.—The neck is well feathered, and the base of the neck of a cock is very strong.

11. Body.—*a. Breast.*—The breast (or chest) is broad and full in front without the extreme depth of breast bone found in squab breeders.

b. Shoulders.—The shoulders are heavy and strongly reinforced with muscles.

c. Back.—The back is strong and well feathered.

d. Sternum.—The sternum is solid, arched in front, and tapered behind where it joints the back.

e. Abdomen.—The abdomen is reduced to the smallest proportions.

f. Wings.—The wings are firmly attached to the shoulders; when fully spread they curve slightly inward. The large feathers are sensitive, long, and wide; the small feathers, abundant and soft. The feathers on top of the wing overlap like the shingles of a roof, while the feathers underneath the wing, which are firm and soft, permit the passage of air during flight. The large stiff quills (usually 10 or 11) growing from the pinion or hand bones of the wing are called the primary flights. The large feathers that grow on the second joint or forearm of the wings (usually 12) are called the secondary flights. The butts of the flights are the portions thereof which enter the flesh. The coverts are the smaller feathers which cover the bases of the flights, and in order from the rear to the front, are called the primary, medium, and lesser coverts.

g. Pelvic bones.—The bones of the pelvis are very firm and join together over the vent and extend toward the sternum on either side of the vent. These bones form a body girdle by which the legs are joined to the body.

h. Rump.—The rump continues the line of the back; it is well covered on all sides with fine, soft feathers.

i. Tail feathers.—The 12 tail feathers are rather short, wide, and overlapping (fig. 5).

j. Legs.—The legs and feet are strong and sensitive; the claws are strong, hard, and deep set.

12. Respiratory channels (fig. 2).—The respiratory channels are highly developed, enabling the pigeon to fly continually for from 12 to 15 hours. The air circulates through the bronchial tubes and lungs and also through nine air sacs, from which other small irregular cavities extend under the skin between the muscles, and even into the inside of the bones. These small air sacs contain a reserve

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of warm air which feeds the lungs during flight when the muscular apparatus consumes a large amount of oxygen. They inflate and collapse alternately, acting as a lift and force pump, which renews the air in the lungs. Not only do these air sacs constitute a source of supply for the lungs, but the warm air which fills them increases the buoyancy of the pigeon in the air and reduces the effort required for propulsion.

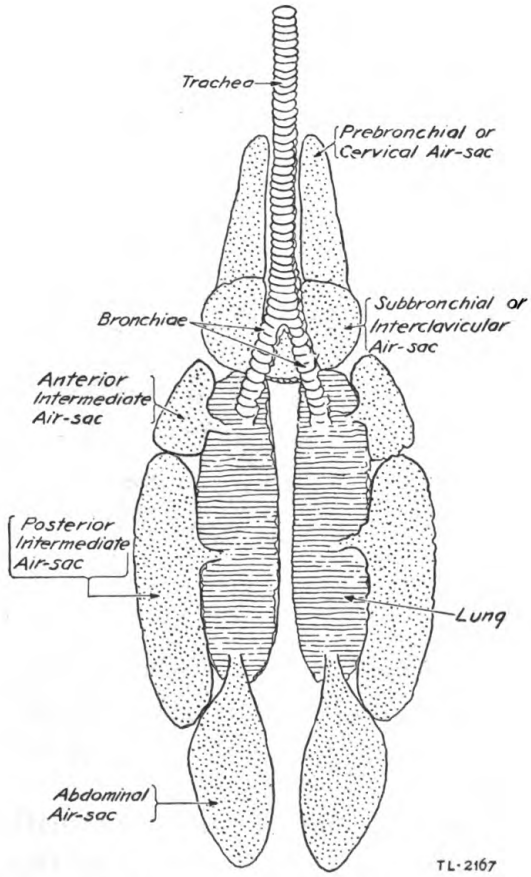

FIGURE 2.—Respiratory channels of the homing pigeon.

13. Digestive organs.—The digestive organs of the pigeon are shown in figure 3.

14. Bloom or milt.—Bloom or milt is a white chalky powder which is excreted through the feathers. This is one of the means provided by nature to protect the feathers against moisture during flight. While bathing, the bloom is deposited in the form of a white scum on the top of the water. In catching a pigeon and holding it, the bloom rubs off, leaving a white substance on the clothes. The absence of bloom indicates that the pigeon is not in condition.

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15. Molt.—*a. Definition.*—The molt is the process of shedding the feathers.

b. Nature.—(1) The molt should not be considered a disease or weakness since the contrary is true, an insufficient molt being a sign of physical debility. It is merely nature's process of furnishing new feathers for the entire body to replenish those lost or injured the preceding year, and to insure a perfect coat of feathers for the coming year. An imperfect molt is certain to detract from the ability of the pigeon the following year, and probably will cause it to breed inferior offspring.

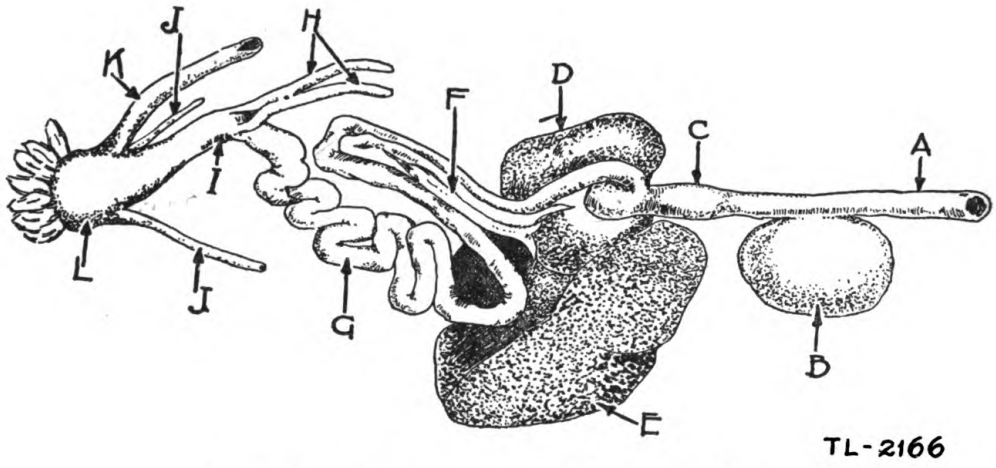

FIGURE 3.—Digestive organs of the homing pigeon

(2) A proof that the molt is not a disease is the fact that pigeons out of condition, and therefore molting poorly, when brought back to good health, will not only resume molting but will molt more rapidly than normally.

c. Time.—Every pigeon should molt, normally, once a year. Mated pigeons generally start about a week or two after the second set of eggs has been laid that season. Unmated old pigeons ordinarily begin in May or June. The molt of young birds depends primarily on the date of hatch, other conditions being normal. Those hatched by the early part of July effect a molt of the head and neck feathers very soon after leaving the nest, and later that year effect a partial molt of all feathers. They complete the process the following summer. Various influences may hasten or retard this process. For example, certain strains tend to molt later or earlier than the average. Exceptionally warm weather may hasten it. The pigeon's physical condition is another important factor, since poor health at the beginning of the season may prevent, and at the

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end of the season may prolong, a thorough molt. Early breeding ordinarily hastens molting, while late breeding tends to retard it.

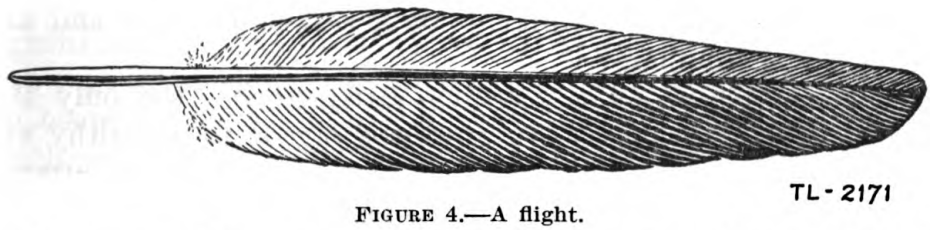

FIGURE 4.—A flight.

d. Process.—The general order of the molt is as follows (fig. 1):

(1) The primary and secondary flights numbered 1 drop first, and new feathers begin to grow in their place.

(2) The next are shed in numerical order when the new feathers are half grown.

(3) When the flights numbered 5 or 6 have been dropped the molt spreads to the neck and shoulders.

(4) By the time the flights numbered 6 or 7 have shed, the tail begins with feathers numbered 2 (see fig. 5); then in the following numerical order—1, 3 and 4, 6, and finally, 5.

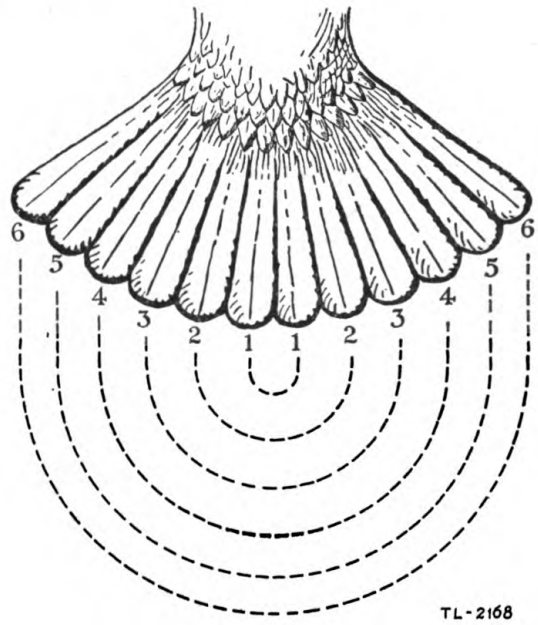

FIGURE 5.—Tail feathers of the homing pigeon.

(5) When the last flights have been shed, the molt is practically complete, except possibly for a few fine body feathers.

e. Care.—(1) This process of supplying new feathers for the entire body once a year is a great physical drain on the pigeons. Hard flying should be temporarily abandoned, and, in exceptionally warm

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weather, it may even be advisable to stop breeding. Exercise flights should be only long enough to insure the proper amount of exercise necessary for the pigeon's health. The pigeon should be allowed to bathe regularly, weather permitting, as it softens the skin and aids the feathers in dropping.

(2) If the molt is not proceeding satisfactorily, the only sure method of correcting this is to restore the pigeon to a healthy vigorous physical condition. Under no circumstances should an attempt be made to aid the molt by plucking the next feathers in order, as in all probability the new feathers will be inferior, or may not even appear, since the substance which gives birth to new feathers is lacking in the sockets. If, however, a feather becomes damaged, it should be repaired as described in paragraph 56. If impracticable to do this it may be plucked, provided at least two months have elapsed since a clean molt was accomplished. A feather with frayed or broken webbing should not be considered badly damaged, since the webbing normally readheres and returns to its proper shape in a day or two.

(3) Soft grain, such as hemp, canary, linseed, and flax, and, in addition, green stuffs, should be fed more than at other times. This food insures good feathers and keeps the weight up to normal by supplying rich, oily, and easily digested food.

SECTION III

CARE

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16. General.—Except when pigeons are being distributed to units, in the hands of units, or in flight, they are housed in lofts which may be buildings or vehicles designed and equipped for that purpose. As soon as the pigeon is settled to a loft, that loft becomes its home loft. Regardless of whether the loft is a fixed building or a mobile trailer or other vehicle, it includes all the equipment, accessories, and utilities necessary for the care of the pigeon. An aviary is a part of a loft, usually built of wire net, open on the sides and roof, in which pigeons are given access to more sunlight than when in the loft proper. A running board is a board built horizontally along the walls of the aviary, usually about 4½ feet from the floor, along which the pigeons walk or perch. Perches are placed on the sides

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of loft walls. A trap is an opening to a loft especially constructed to permit free passage of a pigeon into but not out of a loft. A pigeon is said to have trapped when it has entered the loft through the trap. In front of the trap is placed a lighting board upon which pigeons alight when about to enter the loft. ~~A settling cage is a wire cage in which pigeons are put, and which is placed on the lighting board for use in training pigeons to trap~~. An open trap is one which permits the pigeon to leave the loft as well as to enter it.

17. Preparation of loft to receive pigeons.—The first step to be taken in preparing to receive a shipment of pigeons at a loft is to arrange for the housing of the birds. If it is the initial stock for a loft, the entire loft will be available. On the other hand, in the case of a subsequent shipment, it is desirable to arrange for a separate compartment in which to place the new stock for a period of observation. To prepare the loft, proceed as follows:

a. Clean the loft scrupulously.

b. When the shipment is made by railway express or similar means, keep close contact with the transportation agent to insure that notice of the arrival of the pigeons will be received at the earliest possible moment.

c. As far as possible, dependent upon weather conditions, keep the front of the loft open so that the pigeons will have plenty of sunlight and air, and at the same time be able to familiarize themselves to some extent with the surrounding country.

d. To obviate the harmful effects of drafts and currents of cold air, use unbleached muslin during extremely cold or windy weather to cover openings and thus to exclude drafts while allowing air and light to penetrate. While cold will not ordinarily injure the pigeons the new arrivals may have been accustomed to a different climate and not have been inured to changes or hardships. Young pigeons require special attention. See Section IV

e. Spread a small quantity of sand on the floor of the loft; it serves to supplement the grit (which should always be kept before the pigeons), and at the same time is an aid to cleanliness. 20%.

f. See that there are perches in the loft with ~~10~~ percent more perching space than is necessary for the number of incoming birds.

18. Receipt of pigeons at the loft.—To receive pigeons at a loft, proceed as follows:

a. Immediately transfer them to the loft from the crates or baskets in which they were transported to the loft. It may be expected that they have completed a lengthy trip, and are in comparatively poor condition because of delays in travel and possible lack of proper care and attention.

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b. Immediately thereafter, carefully examine and handle each pigeon, separating the healthy from the sickly ones. Place the healthy ones in a compartment where they can obtain plenty of fresh drinking water, and feed them sparingly. Isolate the ones which appear sick until they are fully recovered.

c. Water, feed, and provide bathing water thereafter as indicated in paragraphs 19 to 21, inclusive.

d. Make an exact inventory of the pigeons, noting band markings, colors, special markings, and physical condition of each bird.

e. While the pigeons are confined, become familiar with them and get them accustomed to the presence of caretaking personnel and to the fact that food is available at certain definite times.

f. Begin training of the new birds immediately. The longer the time between their arrival at their new home and the beginning of their training, the more difficult it will be to train them properly. (See sec. V.)

19. Watering.—*a.* The health of a pigeon depends upon pure drinking water more than upon any other one factor. A pigeon relishes a good, cool drink; consequently keep plenty of cool, fresh water available at all times.

b. The homing pigeon does not drink as do most other birds. The pigeon sticks his bill down into the water up to its eyes, and then takes a long, deep draft like a horse, for this reason, keep the depth of the water in the drinking fountain at not less than 2½ to 3 inches. Always supply water in a fountain or other receptacle which will prevent bathing; never under any circumstances in a pan or other open container.

c. Change the water three times a day in warm weather and clean the container thoroughly each time. In cool weather twice a day may be sufficient, provided the water can be kept clean. ~~Water containing impurities gives a pigeon a sour crop or acute indigestion.~~ If pure water is not readily obtainable, obtain a supply from a sterilizing water bag or other source used for supplying drinking water for troops. When of necessity impure water or that which is of doubtful purity must be used, add only enough potassium permanganate to make the water a rich claret color. ~~On hot days an even teaspoonful of ordinary baking soda added to each gallon of the drinking water may be desirable. The addition of the soda has a cooling effect and improves the water for drinking.~~ Empty the drinking fountains at night in cold weather so that the drinking water will not freeze.

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d. If newly arrived birds suddenly become sick or show a lack of vitality along with looseness of the bowels, it may be due to the change in drinking water. Give them spring or distilled water until they recover and then gradually accustom them to the local water.

20. Feeding.—*a. General.*—The feeding of pigeons is of the greatest importance. Not only is the pigeon's health and general physical condition largely dependent upon the amount and kind of food it eats as well as the times of eating, but it is through the pigeon's appetite that he can be controlled.

b. Diet.—A pigeon's diet includes leguminous seeds, cereal grains, green foods, and grit. The seeds and grains are fed as an ordinary diet in the form of a feed mixture. All grains regardless of type should be of good quality, dry, well seasoned, and free from dirt, weevils, and other foreign matter.

c. Time and amount.—It is easy to overfeed pigeons and more good pigeons are spoiled by overfeeding than by underfeeding.

(1) Feed pigeons *twice* a day during training and three times a day during breeding. Make the morning feeding light, the night feeding heavier, and the midday feeding during breeding lighter than the night feeding. It is a healthy sign for the pigeon to have a full crop at night and an empty crop in the morning. After each exercise, training, or other flight, call the pigeons in for feed and give them a small quantity as a reward. Give them their night feeding after the final daily exercise.

(2) The most effective check upon the pigeon's action is through its appetite. Keep them in such condition that at no time will they refuse food. Too much food causes the pigeons to become sluggish and listless, but if they are always kept a little hungry, they are alert, active, happy, and much more manageable.

(3) Parent pigeons which have young in the nest feed the young by ejecting food from their crops. The parents then want more food. Therefore, if there are young pigeons in the nest, return in about 30 minutes and offer food to the parents, using the can rattle. If they respond, feed them all that they will eat. After the young are 18 days old put a handful of grain daily back in the corner of the nest compartment out of the way of the droppings. The parent pigeons will eat a few grains in the presence of the young, who will try to imitate their parents and by so doing learn to eat by themselves more quickly.

(4) While the pigeons are taking their morning exercise, clean the loft, provide a fresh supply of grit and drinking water, and polish

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the feed mixture. After the pigeons have completed their exercise, call them in with the can rattle for the morning feed.

(5) Always call the pigeons in to feed by means of the can rattle. This consists of any small size can in which several small stones or hard peas have been placed. The sound made by shaking the can is the call which means food to the pigeons. The can rattle has the advantage of producing a constant sound irrespective of the person who uses it. Never use the can rattle unless grain is to be fed to the pigeons.

(6) The pigeons enter the loft through the trap and while they are arriving, scatter the food slowly on the ~~sand-covered~~ floor. During the period of feeding rattle the can frequently in order to keep the pigeons trained to answer the call. First, scatter a handful of grain on the ~~sand~~, and when the pigeons have this nearly eaten, scatter another handful, and so on during the feeding. ~~No harm is done if the pigeons eat some of the sand, providing it is clean, as sand supplements the grit as an aid to digestion.~~ Be sure that the feed is well scattered in order that the stronger ~~cocks~~ will not get all of the choice grains. Pigeons always drink immediately after feeding, and indicate that they have had enough food by going to the fountain for a drink of water. Consequently, when the first pigeon stops to take a drink of water, do not put down any more grain. If any grain remains on the floor after the feeding, remove it at once.

(7) The whole amount of grain for one feeding is never thrown on the floor at one time because an exact estimate of the amount needed cannot be made. If the amount were less, the pigeons would be underfed; if the amount were more, the remaining grain ~~would~~ soon become spoiled and when eaten it might cause sickness. If all the grain is placed on the floor at one time, the pigeons will pick out the kinds which they especially like, and as a consequence, may not select food which contains all the elements needed for their proper development. Another reason why the grain should be scattered a handful at a time is that this method of feeding allows both pigeons and pigeoneer to become better acquainted with one another. It also helps to keep the pigeons on the alert and under control, and permits the pigeoneer to observe them and determine whether any of them are sick, which may become evident by their failure to eat.

d. Varieties of food.—There are four principal classes of food that are necessary for the proper maintenance and development of homing pigeons, proteins, carbohydrates, fats, and green food. In addition to these, a grit mixture is also necessary for the proper assimilation of the pigeon's food.

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(1) *Proteins* furnish the food elements necessary for keeping the pigeon's system in repair. They are consequently of special importance in the diet of homing pigeons and contribute most of the essentials for maintaining the health and efficiency of the homing pigeon, including its muscular force and nervous energy. Examples of foods in the protein class are vetch and peas. These reduce the capacity of the digestive apparatus, but are of great importance in the development of the muscular system, the respiratory system, and the organs essential to flying.

(2) *Carbohydrates* furnish a pigeon with the elements which enable it to work. Those portions not immediately absorbed by work are transformed into fat and thus constitute a reserve which can be drawn on during long flights. Grains which may be fed to pigeons and which furnish the carbohydrates are rice, milo maize, Turkey red wheat, hulled barley, corn, millet, and oats. Turkey red wheat is preferred, as most other kinds of wheat are injurious to the pigeon. Oats should not be used at all unless absolutely necessary at times when the other grains are not available.

(3) *Fats* produce the heating elements necessary to keep the pigeon warm and constitute a reserve which can be drawn upon during long flights. Grains which furnish the fats are rape, flaxseed, and hemp.

(4) *Green food* is essential in certain amounts to enable the pigeon's digestive organs to function properly. Crisp young lettuce, kale (preferably curly), and chickweed are the best green foods. Sprinkle the lettuce with a little table salt since salted lettuce is better liked by the pigeons than that which is not thus prepared. About three times a week, while green food is in season, give the pigeons as much as they will eat. Tie this green food in a bunch and suspend it on the side of the loft about 4 inches from the floor.

(5) The following table gives a comparative analysis of some of the various grains with percentage of the food value as indicated:

Kind of grain	Class	Proteins	Carbohydrates	Fats
		Percent	Percent	Percent
Vetch	Proteins	25. 0	50. 0	1. 5
Peas	do	23. 0	52. 0	1. 5
Rice	Carbohydrates	8. 1	78. 2	2. 2
Kaffir corn	do	12. 5	71. 8	3. 2
Turkey red wheat	do	12. 2	71. 2	1. 8
Hulled barley	do	11. 0	69. 0	2. 0
Corn	do	9. 0	66. 0	4. 8
Millet	do	14. 6	60. 3	3. 6
Oats (not preferred)	do	14. 9	60. 0	4. 5
Rape	Fats	36. 8	?	36. 8
Flaxseed	do	22. 0	30. 0	32.
Hemp	do	23.	36.	26.

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(6) The food which comprises the diet of the homing pigeon, except green food, may also be classed under the two general headings, leguminous seeds and cereal grains. The legumes, white peas, maple peas, tick beans, vetch, etc., carry large amounts of nitrogen and supply the essential muscle-building elements to the diet. While the maple pea is a very satisfactory grain, and better than corn, nevertheless poor maple peas are not as satisfactory as good corn. The cereals fall into two groups, the heat or energy producers, and those which supply regulative elements. Flint corn (*Zea indurata*) is the chief energy-producing food and forms the foundation for practically all pigeon-feeding mixtures. Kaffir corn or milo maize (*Zea saccharata*) is a useful component in mild climates where corn is too heating. The other cereals, rice, millet, etc., are entirely regulative in properties and should be used sparingly and never as a year-round component of the pigeon ration. In addition to the staple grain mentioned above, hemp seed may be fed occasionally in small quantities. Being rich in fat, hemp seed tends to soften and loosen the feathers, properties which are useful in speeding up the molt, but distinctly to be avoided at other times.

e. Selection of food mixture.—(1) The selection of a proper food mixture is entirely a matter of judgment and experience, the condition and performance of the pigeons being the prime consideration, limited by the quality and diversity of grains available in the immediate locality of the loft. The variety as well as the quantity of the food may advantageously be varied by the experienced pigeoneer according to the circumstances under which the pigeons are being maintained, as, for example, for stock breeding, during the molt, short-distance flying, long-distance flying, during warm weather or in tropical climates, during cold weather, and while the pigeons are suffering from disease. However, one or more feed mixtures are listed as standard items of issue and are very satisfactory for general use in any temperate climate. Where deviations are desirable and in the absence of specific instructions, the food mixture should be proportioned in accordance with the properties of the separate grains necessary to produce a resultant mixture to give the desired results.

(2) The various seeds and grains are mixed in proportions to give a feed mixture of certain desirable amounts of proteins, carbohydrates, and fats, depending upon climatic conditions and training activities. Several such mixtures are listed in the Signal Corps General Catalog; however, due to the high cost of certain of the component grains, those bearing the stock numbers 9A1219 and 9A1219.1 are not now

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available for mixture. The mixture 9A1219.2 is issued to lofts in Panama and Hawaii. Other lofts buy their feed by local purchase in peace. In war, suitable mixtures will be issued to lofts of the field forces.

(3) (*a*) A good domestic mixture for normal training and breeding activities comprises—

	Percent
Canada peas	25
Vetch	25
Flint corn	25
Hard red wheat	15
Kaffir corn	5
Large yellow millet	5

(*b*) For feeding pigeons in the tropics the above should be modified by reducing the ~~Canada~~ peas and vetch to 20 percent each and increasing the Kaffir corn and millet to 10 percent each.

(4) A good mixture containing a higher rate of protein suitable for colder climates and also better for continual training and when pigeons are employed in pigeon communication, comprises—

	Percent
Canada peas	~~25~~ 35
~~Maple peas~~	~~25~~
Flint corn	~~25~~ 25
Vetch	~~20~~ 15
Kaffir corn	15

f. Inspecting and polishing grain.—The quality of the food is a most important consideration. The supply of grain is either issued to, or purchased by, the loft. In either case, inspect it as soon as it is received to determine the quality. The grain should be free from taint or mold, which may be detected by sight and smell (musty or soured grain causes sickness), and should be hard and brittle. The latter qualities are determined by biting the grain. If it is hard and brittle, it is in good condition, but if it is soft, do not use it. The grain should be free from weevils which eat out the heart of the kernels, leaving only the shell. The weevils can be detected by biting and also by the small holes which they bore. If the quality of the grain is good, but it is covered with dirt or dust, clean it by sifting before placing it in the storage bins. In addition, when preparing to feed the pigeons, take a sufficient amount of grain from the bin of mixed grain and place it in a small mesh, wire sieve. Remove the dirt and dust by shaking the sieve, and continue the sifting until the kernels of grain are clean and shiny. This operation is called polishing the grain. Then place the polished grain in a convenient container ready to be fed to the pigeons.

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g. Storage and seasoning of grain.—(1) Keep the grain dry. Store it in bins so constructed as to be ratproof and afford a good circulation of air. Turn it over once a week to prevent it from becoming musty and to keep out the weevils and other vermin.

(2) Season the grain before it is fed to the pigeons. This is accomplished by allowing it to get hard and brittle. If the grain is not seasoned, serious sickness may develop. The process of seasoning takes about one year and should be done by the dealer prior to selling. If it is impracticable to secure seasoned grain, the process may be accomplished locally by placing it in separate bins and turning it over daily. On bright sunny days take it out of doors and place it in as thin layers as the equipment permits and expose it to the sunlight. Continue this until the grain is thoroughly seasoned. In an emergency, if there is not enough time to season grain by the above method before it has to be used, place a sufficient supply for two or three days in the oven of a cooking range and slowly heat it. Be careful, however, not to brown or burn the grain.

(3) Seasoned grain may be stored at a loft for a period of six months with a factor of safety. Inspect all grain taken from storage carefully before it is fed to the pigeons.

h. Use and preparation of grit.—(1) Grit is a prepared mixture which is given the pigeon to serve as a mechanical grinder for the food in the pigeon's gizzard and to assist in its assimilation. ~~Grit also purifies the crop and supplies lime for bone building and the forming of egg shells.~~ There are many grit mixtures on the market, most of which contain crushed oyster shell, gravel, sand, small sea shells, crushed limestone, salt, charcoal, and other ingredients.

(2) Between 5 and 10 percent of the food fed a pigeon should be grit. Normally 5 percent is sufficient, except during the breeding season when as much as 10 percent may be fed since the parent pigeons pump grit into the youngsters when they start eating grain.

(3) A preferred grit is made as follows: Thoroughly mix (in the manner of mixing mortar) 20 pounds of medium granite grit, 20 pounds of medium oyster shell, 20 pounds of medium crushed limestone, 5 pounds of medium charcoal, and ⅛ pound of oxide of iron (hematite). Then dissolve 3 pounds of table salt in boiling water and add enough of this solution to the mixture to dampen it thoroughly. Do not add too much water, but only enough to dampen the mixture. Thoroughly mix the whole preparation. The purpose of each of the various ingredients in the mixture is as follows: The granite functions as a grinder, pulverizing the food; the oxide of

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iron has a beneficial effect upon the blood and acts as a tonic; the charcoal purifies the crop, acting as a stomachic, that is, strengthens or stimulates the action of the stomach; the limestone provides the materials for the bones and other hard substances, and also supplies the necessary chemical salts to the blood; and the oyster shells contribute lime which enters into the composition of bones and egg shells.

(4) The grit mixture used is listed in the Signal Corps General Catalog as stock number 9A1322.

(5) Keep grit in the loft constantly, except during the 24 hours before the pigeons are to be sent away to a liberation point 50 or more miles distant for immediate liberation. The grit contains salt and minerals which cause thirst, and the pigeons might land en route for water, thereby losing valuable time and being more exposed to the danger of being shot or captured. Place the grit in a suitable wooden box so designed that the pigeons cannot easily introduce foreign matter into the mixture. However, inspect it daily and remove all foreign matter. Refill the grit container as needed with dry grit. Once a week empty the grit container and clean it thoroughly, add a fresh supply, and destroy the old grit. Keep an ample supply of grit always in stock at the loft.

i. Allowance of feed and grit.—(1) The annual allowance of feed mixture is 52 pounds per pigeon. This is based on the fact that the pigeons, averaging those breeding and those not breeding, will each consume about 1 pound of grain per week.

(2) The annual allowance of grit is 6 pounds per pigeon.

21. Bathing.—*a.* There is no other class of fowls, except the members of the duck family, that so enjoy a bath as do pigeons. Also pigeons that are kept clean are less troubled with mites or feather lice. Omit the bath in freezing weather. During warm weather, on rainy as well as fair days, provide the bath every day.

b. Prepare the bath pan about an hour after the morning feeding and leave it in position about one hour. If the loft has an aviary, always place the bath pan on the floor of the aviary; if not, place it on the floor of the loft. After the pigeons have finished bathing, scrub the pan thoroughly, rinse it out, and remove it from the aviary or the loft. Sweep up any sand which has become wet from the splashing, and replace it by dry sand.

22. Catching and handling.—The successful flight of pigeons depends upon their physical condition and this can be very easily harmed by awkward and improper catching and handling. Do not injure its feathers because if the tail feathers are pulled out through

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awkward handling, the pigeon loses its rudder or if the wing feathers are broken, its flying is greatly impaired. Do not squeeze or bruise the pigeon because the muscles and internal organs are likely to be impaired so as to reduce flying ability.

FIGURE 6.—Catching a pigeon in loft.

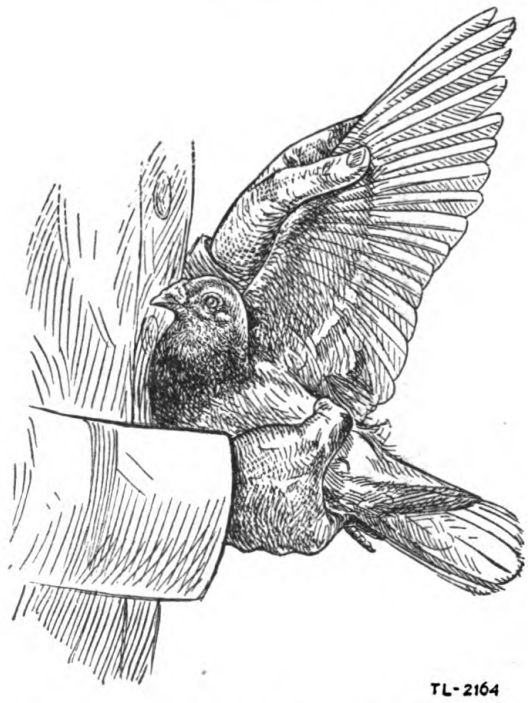

FIGURE 7.—Holding a pigeon for inspection.

a. Catching in a basket.—The proper method of catching a pigeon in a basket, removing it therefrom, and releasing it is completely described in FM 24–5.

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b. Catching in a loft.—Always catch pigeons in nests or on perches. Approach the pigeon calmly, making no fast movement to frighten it, then grasp the bird by a quick closing movement of the hands. Catch the bird from the front, with the thumbs on the back and fingers under the body. Never attempt to catch birds in the aviary, or when flying about the loft.

c. Inspecting birds.—Always hold the breast of the bird against the body when inspecting wing or tail feathers. If the bird is held away from the body for examination of the wing, there is danger of pulling out some feathers should the bird struggle.

d. Basketing birds.—Holding the bird in the right hand with the thumb across the back, and the first two fingers grasping the legs, place the palm of the left hand over the bird's head with the fingers

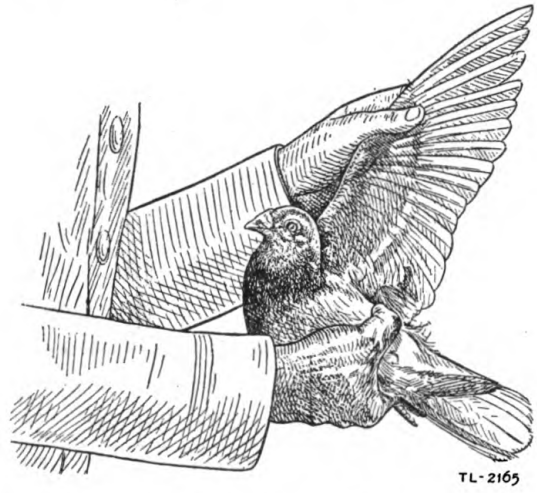

FIGURE 8.—Improper method of holding a pigeon for inspection.

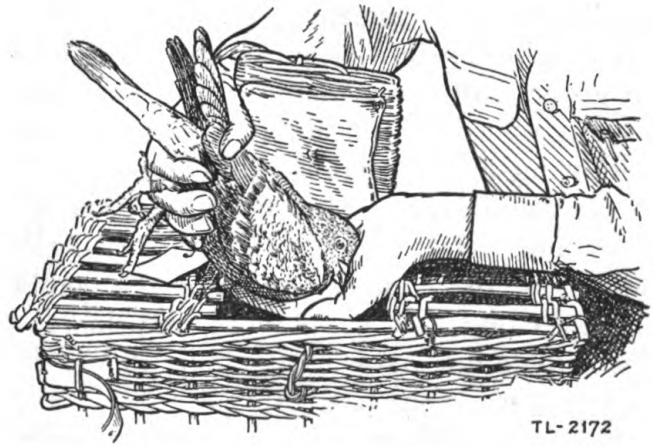

FIGURE 9.—Basketing a pigeon.

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over the breast. Guide the bird into the basket in this manner, and release it only when the bird's feet are on the bottom of the basket. Never basket a bird with one hand only.

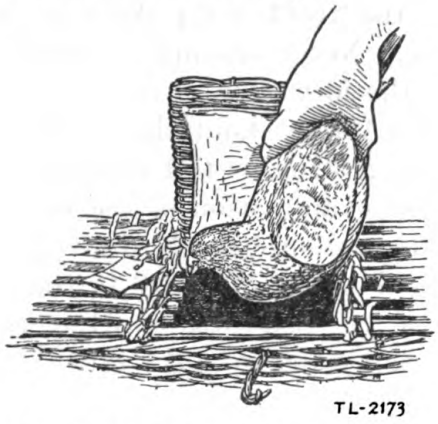

FIGURE 10.—Incorrect method of basketing a pigeon.

SECTION IV

LOFTS

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Routine	23
Classification of pigeon colors	24
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Banding	26
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23. Routine.—Loft management requires that the pigeoneer in charge care for and give constant attention to the needs of the pigeons in his loft. In general, this responsibility can be satisfactorily discharged by adhering to a daily routine in the performance of certain duties. The following are normal requirements:

a. Sweep or scrape all sand and droppings daily from nests, perches, and floor and sift through a fine screen to clean the sand. New sand is added to the cleaned sand and the combined sand is spread in a thin layer on the nests, perches, and floor.

b. Provide fresh drinking water. (See par. 19.)

c. Provide bath water. (See par. 21.)

d. Conduct the prescribed exercise and other training for the pigeons in accordance with a training schedule. This may include

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exercise flights, training flights, signal communication flights, and trial or race flights.

e. Post loft records.

f. Prepare daily quantity of feed, and feed pigeons.

g. Inspect all pigeons as to condition, health, mating, breeding, etc., as may be required under the circumstances.

h. Carry out any special instructions given for the day.

24. Classification of pigeon colors.—*a.* A classification according to the colors of the feathers of pigeons is made. The color of the upper body and wings is the basic color. In addition to the basic color, classifications include the following (see par. 11*f*):

(1) If any of the primary flights are white the pigeon is classed as a "white flight." Unless the flights are pure white the classification "white flight" is not made.

(2) If all the coverts exhibit a light gray fringe on their outer edges and thus present a checkered appearance as contrasted to a solid color, the pigeon is classed as "checkered."

(3) When a pigeon has white patches of feathers on its head, it is classed as "pied." If these white patches extend to its body, it is classed as "splash."

(4) If a pigeon exhibits one or two white feathers about the eyes, it is classed as "tick."

(5) For various other additional classifications for pigeons, see *b* below.

b. The following are examples of classifications of pigeons, together with the authorized abbreviations:

(1) *Basic colors.*

(*a*) Black (Blk)—all feathers are black.

(*b*) Blue bar (Blue)—all feathers are grayish blue with two black bars on each wing.

(*c*) Mealy (Mly)—all feathers are deep grayish silver with one or two red bars on each wing.

(*d*) Barless mealy (Bls Mly)—similar to a mealy, but without the characteristic red bars.

(*e*) Red (Red)—all feathers are a solid brownish-red throughout.

(2) *White flight.*

(*a*) Black with white flights (Blk wf).

(*b*) Blue bar with white flights (Blue wf).

(*c*) Red with white flights (Red wf).

(*d*) Mealy with white flights (Mly wf).

(*e*) Barless mealy with white flights (Bls Mly wf).

(3) *Checkered.*

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(*a*) Black checkered (Blk ch)—basic color black, with a very faint check mark on wings, gray feathers on the under part of the body and under the wings.

(*b*) Dark checkered (Dk ch)—similar to black checkered but showing distinct check marks on the wings.

(*c*) Blue checkered (B ch)—basically blue with even checking of black and gray on wings and body. Blue checkered is the predominant classification of homing pigeons.

(*d*) Red checkered (Red ch)—basically red, with a very faint check mark on wings, gray feathers on the under part of the body and under the wings. The red checkered pigeon normally has very light colored flight feathers.

(4) Grizzled (Griz)—basic markings are the same as for a mealy. In addition, there are fine markings of black or blue all over the pigeon, giving a somewhat dirty appearance.

(5) Examples of combinations of colorings and markings, together with their authorized abbreviations are—

(*a*) Black with white flights pied (Blk wf pd).

(*b*) Red with white flights tick (Red wf tk).

(*c*) Blue bar pied (Blue pd).

(*d*) Black splash (Blk spl).

(*e*) Barless mealy white flight pied (Bls Mly wf pd).

(*f*) Red checkered splash (Red ch spl).

(*g*) Blue checkered tick (B ch tk).

25. Records and reports.—*a.* The following records and reports are required for each loft:

(1) W. D., S. C. Form No. 1132 (Breeding Card).

(2) W. D., S. C. Form No. 67 (Pigeon Breeding Record) (book).

(3) W. D., S. C. Form No. 1183 (Pigeon Flight Record) (book).

(4) W. D., S. C. Form No. 68 (Pigeon Pedigree).

(5) W. D., S. C. Form No. 1133 (Monthly Pigeon Loft Report).

b. Breeding card (see fig. 11).—The breeding card is fastened on the outside of the nest compartment as soon as the cock and hen are mated and take possession of a nest compartment, and remains there during the breeding activities of the particular pair of parent pigeons. The data serve to provide the initial identification record of the youngsters and to permit a careful check on the progress of their development. Entries must be timely, accurate, and legible. When the youngster leaves the breeding compartment the information relating to it that appears on the breeding card is entered in the Pigeon Breeding Record. (See *c* below.) The blank spaces on the breeding card are filled in as follows:

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(1) *Pair number.*—Number of the nest compartment the parent pigeons occupy.

(2) *Loft of.*—Name of the post, camp, or station where the loft is located and the designation of the loft.

(3) *Season.*—Calendar year.

(4) *Cock number.*—Data on the leg band that relate to the cock's identification.

(5) *Color.*—Color of the cock.

(6) *Sire and dam.*—Strain of each of the cock's parents.

(7) *Hen number, color, sire, and dam.*—Data relating to the hen similar to that furnished on the cock.

(8) *Date laid.*—Month and day each egg is laid.

(9) *Hatched.*—Month and day each egg is hatched.

(10) *Banded.*—Month and day each youngster is banded.

(11) *Band number of youngsters.*—Markings appearing on the band placed on the right leg with the letters USA and year of hatching in the left-hand column, and the loft designation and serial number assigned to the youngster in the right-hand column.

(12) *Color, sex, remarks.*—The color of the youngster and any remarks such as to its disposition when it leaves the breeding compartment. Generally, the sex cannot be determined at this time and is entered at a later date.

(13) If the egg is removed from its parents to be hatched by other pigeons or if it is destroyed, the fact is entered on the card.

Pair No. 40 Loft of Fort Monmouth, N.J. SPL-2D

BREEDING CARD Season, 1939

Cock No. USA-38-FtM-68 Color B ch { Sire Soffle-Bastin / Dam Logan-Osman-Soffle

Hen No. USA-37-FtM-5 Color B ch wf pd { Sire Soffle / Dam Stassart

Date Laid	Hatched	Banded	Band Number of Youngsters		Color, Sex, Remarks
3/2	3/21	3/28	USA-39-	FtM-467	B ch,C, to SPL-1D
3/4	3/21	3/28	USA-39-	FtM-468	B ch pd,H,to SPL-1D
4/13	Eggs to pair No. 68, USA-37-FtM-157xUSA-38-FtM-120				
4/15	Replaced by nest eggs.				
5/23	6/11	Destroyed.			
5/25	6/11	Destroyed.			

W. D., S. C., Form 1182. TACK THIS CARD NEAR THE NEST. U. S. GOVERNMENT PRINTING OFFICE. 1939

FIGURE 11.—Pigeon breeding cards.

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c. Pigeon breeding record.—The pigeon breeding record is a *permanent* record maintained at each loft where breeding activities are conducted. (See fig. 12.) Data for the record is taken from the breeding card of the youngster (*b* above) and the breeding record of the parent pigeons. The following entries are made under columns headed—

(1) *Band number.*—Entries are made in numerical sequence of band numbers assigned to youngsters hatched during the year.

(2) *Color.*—Color and sex of each youngster is entered in this column opposite its band number as taken from its breeding card.

(3) *Nest number.*—Number of the nest occupied by the parent pigeons, and taken from the breeding card.

(4) *Band number, color, sire, dam.*—Enter data on each parent on a separate line. These data are obtained from the breeding card or pigeon breeding records of the parent birds.

(5) *Band number, color, G. sire, G. dam.*—Enter on each line the data for the parent pigeons (grandparents of the youngster). These data are obtained from the breeding records of the grandparent birds.

(6) *Strain.*—The strains of the grandparents of the youngsters are entered opposite their band and color.

(7) *Notes.*—A small space below each entry, as indicated in figure 12, is used to show—

(*a*) Date youngster was hatched.

(*b*) Performance record of the youngster.

(*c*) Band numbers of any of its outstanding offspring.

(*d*) Under Sire and Dam, performance record of parent, to include maximum flight distance to date, and outstanding racing performance if any.

d. Pigeon flight record.—A pigeon flight record is prepared for each pigeon and is a complete account of its performance. (See fig. 13.) Each flight made by the pigeon is entered on the record which serves to provide a detailed account of the latter's training. The form is retained in the loft files for a period of five years from the date of the last entry. A book containing the flight records of all birds of one loft is usually kept, upon which appears the loft designation and classification as to day or night flying. The flight record is started at the time the youngster is removed from the parent pigeons and placed in the flying loft. The data are entered as follows:

(1) *Band number.*—Data on the identification band as shown on the breeding card.

(2) *Color.*—Color of the pigeon, also taken from the breeding card.

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(3) *Sex.*—If the sex cannot be determined when the form is started it is entered later.

(4) *Hatched.*—Date shown on the breeding card.

(5) The record of each flight on a separate line under each column as follows:

(*a*) *Date of flight.*—Month, day, and year the flight was made. The year may be entered at the head of the column to save repetition.

W. D., Sig. C. Form No. 67

WAR DEPARTMENT
SIGNAL CORPS UNITED STATES ARMY

PIGEON BREEDING RECORD

Band No. -1939-	Color	Nest No.	Band No.	Color (Sire / Dam)	Band No.	Color (G. Sire / G. Dam)	Strain
USA 39 FtM 467	B ch C	40	USA 38 FtM 68 B ch 200 miles.		USA 32 FtM 159 B ch		Soffle-Bastin, Logan-
	3/21/39				USA 29 FtM 210 Blue pd		Osman-Soffle
			USA 32 FtM 5 B ch wfpd Winner-300 mile		NA 27T 6100 Blue		Soffle
			"Concourse" 1939		AU 34RS 572 B ch		Stassart
	Races-1939: 100; 100-3rd; 200; 200-1st.						
468	B ch pd H		(Nest mate to No. 467)				
	Races-1939: 100; 100; 150-1st; 200						
469	Blue wf C	48	USA 35 FtM 111 Blue 400 mile winner.		USA 30 FtM 123 B ch		Longton
	3/23/39		"Always Faithful"		USA 31 FtM 93 B ch tk		Longton-Toft
			USA 29 FtM 210 Blue pd 720 miles.		USA 28 FtM 183 B ch		Soffle
			Winner "Hall of Fame" award, 1935.		USA 27 FtM 73 Blue pd		Osman-Logan
	Races-1939: 200-2nd						

FIGURE 12.—Pigeon breeding record.

(*b*) *Nature of flight.*—Enter appropriate description of flight, such as training, signal communication, or race; and how tossed, such as single, double, or group tossed. Abbreviations of entries may be used; train, for training; sig com, for signal communication; ST, for single tossed; DT, for double tossed; GT, for group tossed.

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(*c*) *Competition.*—Number of lofts and the number of pigeons entered in a competition or race.

(*d*) *Distance.*—Distance traveled in miles (air line) for each flight, and the *direction from the loft to the point of release.* Abbreviations for directions may be used, for example, NW, SE, etc.

(*e*) *Position and speed.*—Place won in a race or single-tossed training flight, such as first, second, etc., if known, and the speed attained in yards per minute. The speed is entered for all flights if data are available for its calculation. A note is made of birds, when group-tossed, which fail to arrive at the loft with the group, indicated as "Late"; or which break away from the group and arrive at the loft before it, indicated by a note as to its position of arrival, such as 1, 2, etc.

PIGEON FLIGHT RECORD

2nd Sheet

Band No. USA-39-FtM-467 Color B ch Sex C Hatched 3/21/39

DATE OF FLIGHT -1939-	NATURE OF FLIGHT	COMPETITION		DISTANCE	POSITION AND SPEED	SPEED OF WINNING BIRD	TOTAL DISTANCE, ALL FLIGHTS
		Lofts	Birds				
8/12	GT-Train	2	54	37.3 SW	-	1137	234.8 272.1
8/13	GT-Train	2	52	45.3 S	late	967	317.4
8/15	DT-Train	1	34	56.0 W	12-1132	1276	373.4
8/17	ST-Train	3	76	63.5 SW	5-1282	1297	436.9
8/20	Race	22	226	90.1 SW	11th to loft-1219	1373	527.0
8/23	GT-Train	1	34	56.0 S	1-1381	Group-1345	583.0
8/27	Race	21	230	90.1 SW	3-961	966	673.1
8/29	Sig Com	1	16	15.0 NE	1200	-	688.1
8/31	ST-Train	2	53	45.3 SW	1-1331	-	733.4
9/3	Race	24	247	186.4 SW	7-1146	1190	919.8
9/5	GT-Train	2	49	28.5 W	-	1242	948.3
9/7	DT-Train	1	30	56.0 SW	3-1231	1239	1004.3
9/10	Race	24	220	186.4 SW	1-1228	-	1190.7

FIGURE 13.—Pigeon flight record.

e. Pigeon pedigree record. (See fig. 14.) — The pigeon pedigree record is accomplished for each pigeon transferred from one loft to another when the lofts are at different stations or belong to different units.

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Pedigree records are not furnished with pigeons sold as surplus stock. The data to be entered on the form are taken from breeding records and other pedigree records. The following information is entered:

(1) Name, color and sex, registry number (band number), date hatched, by what loft bred, and the flight record of the pigeon in the spaces provided.

WAR DEPARTMENT
SIGNAL CORPS UNITED STATES ARMY

PIGEON PEDIGREE

PEDIGREE

Name Dust Bowl
Color—Sex B ch C
Reg. No. USA 39 FtM 467
Hatched March 21, 1939
Bred by Pigeon Section, Fort Monmouth, N. J.

Record Raced 100, 100, 200, 200 as young bird winning 3rd 100, and 1st 200.

REMARKS

Birds of this family have been consistent winners at all distances. Should be mated to a Soffle hen for best results.
Signed John H. Jones
Captain, Signal Corps
Date January 16, 1940

FATHER

USA 38 FtM 68 B ch
200 miles.

MOTHER

USA 37 FtM 5 B ch wf pd
300 miles. Winner of 300 mile "Concourse" 1939.
Dam of USA 39 FtM 474, 1939 Futurity winner.

GRANDFATHER

USA 32 FtM 159 B ch
600 mile "Concourse" winner, 1936.
Strain-Soffle-Bastin.

GRANDMOTHER

USA 29 FtM 210 Blue pd
"Always Faithful"
720 mile National winner.
Awarded "Hall of Fame" in 1935.
Logan-Osman-Soffle.

GRANDFATHER

NA 27T 6100 Blue
Bred by N. Ross, Phila.
Reserved for stock.
Sire of many long distance winners.
Pure Soffle.

GRANDMOTHER

AU 34RS 572 B ch
Bred by T. O'Mara, West New York, N. J.
A daughter of "Epinard"
Pure Stassart.

Name "Dust Bowl" Band No. USA 38 FtM 467 Color—Sex B ch C

Form No. 68—W. D., Sig. C. 3—10131

FIGURE 14.—Pigeon pedigree record.

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(2) Band numbers and color of its parents.

(3) Band number, colors, and strains of its grandparents.

(4) In the space provided for remarks are stated all pertinent matters relating to the pigeon or its strain bearing upon its ability and breeding value.

(5) In the spaces under Father, Mother, Grandfather, and Grandmother, additional information pertaining to the flying and breeding record of these is noted.

(6) The remaining entries are completed as indicated on the form.

f. Monthly pigeon loft report. (See fig. 15).—The monthly pigeon loft report is prepared on the last day of each month for each loft at a post, camp, or station. The entries are typewritten.

(1) *Number of copies and disposition.*—(*a*) Normally the report is prepared in *triplicate.* One copy is retained at the loft, and the two remaining copies are forwarded to the corps area or department signal officer who retains one and sends the other to the Chief Signal Officer. If the lift pertains to a pigeon signal company in the field, one of the remaining copies is sent to the signal officer of the unit to which the loft is attached, and the other to the commander of the pigeon signal company.

(*b*) In addition to the procedure prescribed above, a *fourth copy* is prepared for each loft located at an Air Corps aviation field or for each loft which has had pigeons released from aircraft during the period covered. This additional copy is forwarded to the corps area or department signal officer with the others and sent by him to the Chief of the Air Corps for the latter's information.

(2) The blank spaces on the card are filled in as follows:

(*a*) *Month ending.*—Month, day, and year.

(*b*) *Designation of loft.*—As prescribed by AR 105-200.

(*c*) *Station.*—Name of the post, camp, or station where the loft is located.

(*d*) *Number of pigeons on hand at end of month.*—These notations pertain to birds over 6 weeks of age:

1. Male.—Total number of banded male pigeons.

2. Female.—Total number of banded female pigeons.

3. Total.—Total number of banded male and female pigeons in the loft at the end of the period covered.

4. Authorized.—Total number of pigeons authorized the loft in accordance with allocations made by the Chief Signal Officer.

(*e*) *Losses during month.*—These notations pertain to birds over 6 weeks of age.

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MONTHLY PIGEON LOFT REPORT

For the month ending April 30, 1940

Designation of loft SPL-1D-FtM Station Fort Monmouth, N. J.

Number of pigeons on hand at end of month: Male 141 Female 138 Total 279 Authorized 300

Losses during month: Disease 1 Accident 1 Flight 2 Sale 48 Total 52

Breeding activities: Mated pairs 98 Hatched 31 Squeakers 4 to 6 weeks 62

PRACTICE FLIGHTS

Date	Number of pigeons	Distance, direction	Average time	Number lost	Weather conditions	Tossed from—
2	46	14.7 NSW	1078 yds.	0	cloudy	CT-grd.
4	53	10.8 NW	991	0	clear	CT-grd.
5	38	19.3 SW	1139	0	showers	DT-grd.
7	16	10-20 E	1200	0	clear	ST-boat
9	52	37.3 SW	1321	0	cloudy	DT-grd.
12	38	23.5 NNW	1142	1	rain	DT-grd.
15	65	46.3 SW	1442	0	cloudy	ST-grd.
15	8	25.0 N	1100	0	cloudy	ST-air
18	43	55.0 SW	1381	0	clear	DT-grd.
19	64	19.3 SW	890	0	light fog	CT-grd.
23	38	29.7 NW	1034	1	cloudy	ST-grd.
26	45	65.3 SW	1521	0	clear	ST-grd.
28	38	90.1 SW	1232	0	clear	DT-grd.

INSTRUCTION BY LOFT PERSONNEL

Organization receiving instructions	Number hours	Nature of instructions
National Guard N.C.O. class	1	Care & use of pgns. in field.
Signal Corps School Officers class	2	Care & use of pgns. in field.

SUPPLIES

Item	On hand beginning of month	Received during month	Consumed during month	On hand end of month
Feed mixture	500 lbs	2000 lbs	900 lbs	1600 lbs
Grit	650	0	100	550
Nest materials	50	0	20	30

LOFT PERSONNEL

Name	Grade and rating	Duties
John W. Jones	St. Sgt.	Pigeoneer in charge
William X. Smith	Pfc. 4 cl.	Assistant pigeoneer
James R. Adams	Pfc.	Chauffeur

W. D. S. C. Form 1133—Revised 5-31-38 SEE REVERSE SIDE

SUMMARY OF TRAINING

Young pigeons Young birds have been trained up to ten miles with daily single toss flights from all directions; two flights daily.

Old pigeons A total of twenty-five training flights made with old birds at distances up to 90 miles. 36 birds used for signal communication.

REPORT OF SIGNAL CORPS MOTOR VEHICLES ASSIGNED TO LOFT				REPORT OF MOBILE LOFTS		
Type of vehicle	½ ton trk.	1 ton trk.		Type	Trailer	Trailer
Vehicle No.	W-21703	310269		Vehicle No.	W-0727	W-0730
Condition	Excellent	Good		Condition	Good	Good
Total mileage	53240	21355		Times settled	5	1

REMARKS AND RECOMMENDATIONS

USA 35 FtM 123 and USA 37 FtM 10 lost on training flights.

ALFRED B. DALEY
Capt., Signal Corps, Signal Officer.
Officer in Charge.

FIRST ENDORSEMENT

....., 19.....

Headquarters
To:

U. S. GOVERNMENT PRINTING OFFICE 191380

FIGURE 15.—Monthly pigeon loft report.

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1. *Disease.*—Total number of banded pigeons lost during the month as a result of disease.
2. *Accident.*—Total number of banded pigeons lost during the month as a result of accident.
3. *Flight.*—Total number of banded pigeons lost during the month while in flight. (Enter band numbers under Remarks.)
4. *Sale.*—Total number of banded pigeons sold as surplus during the month, if any. If none, so state.
5. *Total.*—Total number of banded pigeons lost during the month from all causes listed. The total number of pigeons on hand at the end of the month as shown on the previous report less the losses on the current report should equal the number on hand as shown on current report.

(*f*) *Breeding acitivities.*

1. *Mated pairs.*—Total number of pairs of parent pigeons mated or *breeding* purposes.
2. *Hatched.*—Total number of youngsters hatched during the month.
3. *Squeakers, 4 to 6 weeks old.*—Total number of youngsters of this age on hand.

(*g*) *Practice flights.*—For each flight enter—

1. *Date.*—Day of the month as 1, 2, 3, etc.
2. *Number of pigeons.*—Total number of pigeons participating in the flight.
3. *Distance, direction.*—Air-line distance of the flight in miles and the direction from the loft to the point of release.
4. *Average time.*—Average speed in yards per minute made by individual pigeons or the group on the flight is shown.
5. *Number lost.*—Total number of pigeons lost during the flight. If none, so indicate.
6. *Weather conditions.*—Description of prevailing weather during the flight, as clear, cloudy, light fog, showers, rain, etc.
7. *Tossed from.*—Group or single tossed, and tossed from airplane, boat, or ground are indicated. Group or single tossed may be abbreviated as in *d* (5) (*b*) above.

(*h*) *Instruction by loft personnel.*—Organizations receiving instruction, number of hours, and nature of instruction.

(*i*) *Supplies.*—For each item enter the number of pounds on hand at the beginning of the month, received during the month, consumed during the month, and balance remaining on hand at the end of the

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month. If more than one loft of a single station is reported on for the month only one report need show this information, and reference is made on the reports of the other lofts to this report.

(*j*) *Loft personnel.*—The name, grade, rating, and duties of all personnel working with the loft during the month.

(*k*) *Summary of training.*—Enter under the proper headings a summary of the training given each class of pigeons as taken from the weekly training schedules.

(*l*) *Report of motor transportation.*

1. Type of vehicle.—Type of motor transportation used, if any.

2. Vehicle number.—U. S. A. registration number.

3. Condition.—Condition or state of maintenance of the vehicle.

4. Total mileage.—Total mileage the vehicle has covered at the end of the month.

(*m*) *Report of mobile lofts.*

1. Type.—Type of mobile loft.

2. Vehicle number.—U. S. A. registration number.

3. Condition.—As in (*l*) *3* above.

4. Times settled.—Number of times loft has been settled in new locations during the month.

(*n*) *Remarks and recommendations.*—Enter any remarks or recommendations on matters not covered elsewhere on the report that will be of interest to the corps area or department signal officer, or to the Chief Signal Officer. Where matters covered are acted upon by the corps area or department signal officer, proper notation is made on copies forwarded to the Chief Signal Officer and Chief of Air Corps. Noted in this space are band numbers of birds lost in flight, and the number of birds culled (including youngsters) during the month, together with reasons therefor.

(*o*) *Officer in charge.*—The name, grade, and office is typed and report signed.

26. Banding.—*a.* Each breeding loft is furnished with identifying metal leg bands to be used in banding all youngsters that are to be reared and included in the loft stock. These bands, PG–16, are manufactured in pairs, each pair bearing the serial number assigned the pigeon.

(1) One of the pair of bands bears a marking which includes U*S, the last two figures of the calendar year the bird was hatched, a designation of the loft, and a serial number. This band is placed on the left leg and indicates that the pigeon was bred by the United States Army. It should not be removed as it serves to identify the pigeon with its breeding record.

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(2) The other band of the pair bears a marking identical to that described above except that instead of the "U*S" it has the letters "USA." It is placed on the right leg and means that the pigeon was bred by, and is the property of, the United States Army. This band is removed whenever the pigeon ceases to remain the property of the United States Army.

(3) The following loft designations are used on bands:

For Mommouth, N. J.	FtM.
For Benning, Ga.	4CA.
Fort Sam Houston, Tex.	8CA.
Quarry Heights, C. Z.	CZ.
France Field, C. Z.	CZ.
Schofield Barracks, T. H.	HT. or TH.
Fort Wm. McKinley, P. I.	PI.
Fort Mills, P. I.	PI.

(4) Characteristic band markings of right-leg bands are—

USA 36 FTM 15.
USA 34 4CA 407.
NSA 33 CZ 008.
USA 36 HT 0119.
USA 36 PI 0226.

b. In addition to the banded pigeons bred and owned by the United States Army, there are those of the United States Navy and two large national associations of civilian pigeon fanciers, The American Racing Pigeon Union and the International Federation of American Homing Pigeon Fanciers, as well as numerous smaller organizations. The following examples illustrate the character of the legends used on the bands:

USN 32 492.
AU 28 EC 1245.
IF 27C6700.

c. When banded pigeons are lost in flight, their band markings are listed on the Monthly Pigeon Loft Report. (See par. 25*f*.)

d. (1) Each loft is authorized various colored, spiral, celluloid leg bands for special identification purposes. For example, all pigeons in a particular compartment of each loft may be fitted with celluloid bands of the same color to facilitate the pigeoneers keeping track of them.

(2) These Bands, PG-15, are requisitioned in the following colors on the basis of 4 per pigeon per year; red, yellow, green, light blue, dark blue, black, and pink.

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27. Loft equipment.—*a.* Tables of Basic Allowances prescribe allowances for the pigeon signal company. Other lofts requisition items based on the number of authorized pigeons and their particular needs. The necessary equipment and supplies will be issued at the discretion of the Chief Signal Officer on requisitions approved by the corps area and department signal officers.

b. In general, the following items of equipment and supplies in varying numbers will meet the normal requirements of pigeon lofts:

x Bands, PG–15, assorted colors (red, yellow, green, light blue, dark blue, black, and pink).

Baskets, assorted sizes (basket, metal, collapsible, 4-bird; basket, meal, rigid shipping, 15-bird; PG–5, basket, stock, 15-bird; PG–8, basket, triangular, 4-bird; PG–12, basket, rigid crate, 30-bird).

Bowl, PG–29.

Brush, PG–36.

Cover, PG–31.

x Feed, pigeon, mixed, in 50–pound sealed tins, per Spec. 24–17, or component items.

x W. D., S.C. Form, No. 1132 (Pigeon Breeding Card).

x W. D., S.C. Form, No. 67 (Pigeon Breeding Record) (book of 500 pages).

x W. D., S.C. Form, No. 1183 (Pigeon Flight Record).

x W. D., S.C. Form, No. 68 (Pigeon Pedigree Record).

x W. D., S.C. Form, No. 1133 (Monthly Report of Pigeon Loft).

Fountain PG–37.

*x Grit mixture.

x Message Holder, PG–14.

Pan, PG–38.

Pan, PG–41.

x Chips, quassia.

Scraper, PG–34.

x Shavings, cedar.

Sieve, PG–35.

x Stems, tobacco.

Tray, PG–21.

Tray, PG–22.

x Indicates expendable items.

* Obtained by local purchase except for lofts in Hawaiian and Panama Canal Departments.

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c. A list of medical supplies (furnished by the Medical Department) found useful in treating the more common pigeon diseases is shown in Section VII.

28. Message holders.—*a.* Message holder, PG–14, consists of a telescopic aluminum weather-tight tube fitted with two leg bands, by means of which the message holder is attached to one of the pigeon's legs. (See FM 24–5.) Prior to attaching the holder to the pigeon's leg, the leg bands may be formed by bending them around a round lead pencil so that their curves are perfectly smooth. (See fig. 16.) The pencil is removed by bending the bands outward, from the base, in such a manner that the curves are not destroyed. (See fig. 17.)

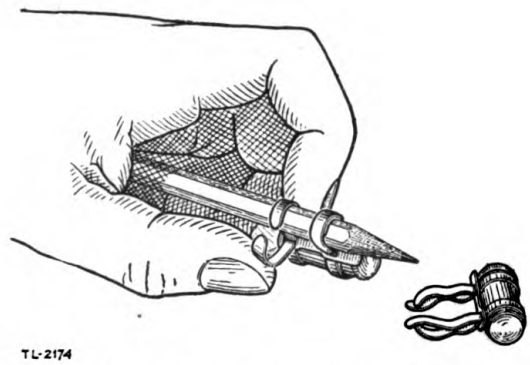

FIGURE 16.—Forming leg bands of a pigeon holder about a lead pencil.

FIGURE 17.—Leg bands properly formed for attachment to pigeon's leg.

b. To attach the holder to a pigeon's leg make sure that the leg bands are sufficiently open to slip easily over the leg, then secure the message holder by pressing in the leg bands around either leg. See that the removable end of the message holder is toward the pigeon's body. If the holder is not secured right side up, in this manner,

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the message may be lost while the pigeon is in flight. In pressing in the leg bands take care not to have them bind the leg nor to be loose enough to slide over the foot.

c. Always turn the holder so that it rests on the front of the leg; if on the back of the leg the holder interferes with the bird while walking and when its legs are under the tail while flying. (See fig. 18.)

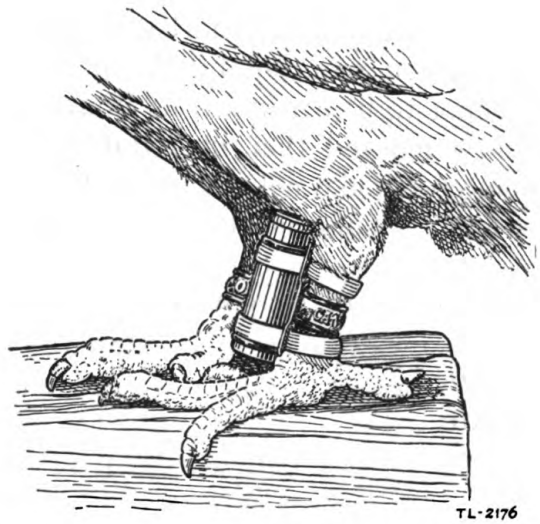

FIGURE 18.—Message holder attached to pigeon's leg.

d. Pigeons to be used for signal communication should be trained with the message holder attached to the leg to accustom them to carrying this piece of equipment. When pigeons are to be distributed to combat troops, message holders may be either attached to their legs or may be delivered separately, according to whether or not the receiving troops are known to have had training or experience in handling birds. In connection with this status of training, the personnel of a loft should make every effort to contact message center units being served in order to give using personnel necessary instruction in the care, handling, and release of birds.

e. To remove a message from a pigeon, first catch the pigeon after it has trapped. Hold the pigeon in the one hand, extend the right leg, and remove the message holder with the other hand. Release pigeon in the loft.

f. When it is necessary for a pigeon to carry a message and a message holder is not available, the message blank may be folded and attached by looping it around the leg band and tying the two ends of the blank together with a piece of thread or light weight string. *Under no circumstances should a string or rubber band be wound*

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around the pigeon's leg as it will stop the circulation and may result in the pigeon losing its leg.

29. Loft inspection.—The inspection of pigeon lofts is covered in AR 105-200 and in the following paragraphs.

30. Inspector's guide.—*a.* To assist the inspector in investigating all phases of the pigeon loft and its activities at a post, an itemized list of questions and statements covering the major points of the inspection are listed below as a *guide only.* Each question need not be answered in the written report if a statement embodying all the necessary information required by the particular heading will suffice. This list is not to be construed as limiting the inspection in any manner. It is suggested that in following the questions and statements, the inspector make notes on a pad or notebook covering only the remarks and recommendations he wishes to include in his report.

b. The suggested points to be covered in the inspection are as follows:

(1) *Stationary lofts.*
(*a*) State of repair.
1. Roof
2. Walls.
3. Floor.
4. Wire netting.
5. Nest compartments.
6. Perches.
7. Running boards.
8. Water trough.
9. Traps.
(*b*) Location with respect to surroundings.
(*c*) Size, capacity in number of pigeons.
1. Number of compartments.
2. Capacity of each compartment.
(*d*) Use made of loft, as breeding, stock, training, etc.
(*e*) Sanitary condition.
(2) *Mobile lofts.*
(*a*) Description of loft.
(*b*) State of repair. (See list of points under stationary loft.)
(*c*) Sanitary condition.
(*d*) Use made of loft.
(*e*) Transportation used to move loft.

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(*f*) Requirements of post activities for mobile lofts.
(3) *Automotive lofts.*
(*a*) State of repair of loft. (See list of points under stationary loft.)
(*b*) State of repair of motor vehicle.
(*c*) Sanitary condition of loft.
(*d*) Use made of loft.
(*e*) Gasoline and lubricants for vehicle.
1. Provided from Signal Corps funds?
2. Are allotted funds sufficient?
(*f*) Requirements of loft activities for automotive loft.
(4) *Experimental lofts.*
(*a*) Description of lofts.
(*b*) Purpose for which provided.
(*c*) Nature of tests made and results.
(*d*) State of repair.
(*e*) Requirements for retaining the loft on completion of test.
(5) *Care of pigeons.*
(*a*) Watering.
1. Adequate facilities for drinking water.
2. Water changed to provide fresh supply during the day.
3. Pans or trough cleaned.
(*b*) Bathing.
1. Adequate facilities for bathing.
2. Water changed when soiled.
3. Bath pans cleaned.
(*c*) Feeding.
1. Diet of proper foods.
2. Feed mixture of good quality.
3. Pigeons fed proper amounts of feed mixture.
4. Daily ration correctly proportioned among the different feedings.
5. No excessive grain in loft.
6. Grit mixture of good quality.
7. Grit available in loft.
8. Grit box kept clean of foreign matter and droppings, and contents changed weekly.
9. Condition of pigeons as a result of feeding methods followed.
10. Can rattle used to call pigeons when food is offered.
(*d*) Catching and handling pigeons.
1. Proper methods followed.

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2. Can loft personnel work with the pigeons without unduly disturbing or exciting them?
3. Do the loft personnel appear to be well acquainted with the pigeons and know their characteristics?

(*e*) Miscellaneous.
1. General appearance of the pigeons.
2. Diseases that have been prevalent in the loft, treatment and response.

(6) *Training of pigeons.*

(*a*) Training program.
1. When prepared.
2. Period covered.
3. Supervision.

(*b*) Training schedules.
1. When prepared.
2. Period covered.
3. Supervision of training schedules.

(*c*) Training objectives.
Requirements fulfilled; if not, action taken.

(*d*) State of training of all pigeons.
1. Old pigeons.
2. Young pigeons.
3. Day fliers.
4. Night fliers.

(*e*) Racing activities.
1. Number of pigeons entered.
2. Number of racers entered.
3. Results accomplished and comparison of loft entries with civilian entries.

(*f*) Show activities.
1. Competitions entered.
2. Number of entries and results.
3. Comparison of loft entries with civilian entries.

(*g*) Special training along experimental lines.
1. Nature of training.
2. Purpose.
3. Number of pigeons so trained.
4. Results.

(7) *Breeding of pigeons.*

(*a*) Period of year devoted to breeding.

(*b*) Number of pairs mated for breeding purposes.

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(*c*) Number of youngsters hatched from breeders.
(*d*) Number of youngsters reared from breeders.
(*e*) Selection of male and female pigeons for mating.
1. Method followed in making selection.
2. Results obtained from the mating.
(*f*) Breeding stock.
1. Is the stock on hand suitable for maintaining the required standards?
2. Is the loft equipped to conduct its own breeding or should youngsters be furnished annually? If so, in what number, sex, and class of fliers (day or night)?
(8) *Feed.*
(*a*) How obtained.
(*b*) Quality of feed received.
(*c*) Facilities for local purchase of feed mixture and for seeds and grains, components of the diet.
(*d*) Methods of storing feed.
(*e*) Is feed mixture polished before feeding?
(*f*) What is the composition of the feed mixture used normally?
(*g*) Who inspects new shipments of feed received at the loft?
(*h*) What is the composition of grit used?
(*i*) Is method of obtaining feed mixture and grit satisfactory and economical?
(9) *Storeroom.*
(*a*) Facilities available.
(*b*) Sanitary condition.
(*c*) Neat and systematic arrangement of stores.
(*d*) Storage capacity for separate grains and feed mixture.
(*e*) Storage capacity for grit.
(*f*) Conditions relative rats, mice, etc.
(*g*) Frequency of inspection by local personnel.
(10) *Equipment.*
(*a*) Adequacy of loft equipment.
(*b*) Condition of equipment.
(*c*) Baskets.
1. Number and size.
2. Condition.
(*d*) Bands, PG–16.
1. How safeguarded.
2. When received with respect to breeding season.

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3. Is quantity furnished sufficient?
4. Method of assigning numbers to youngsters.
(11) *Records.*
(*a*) Records required.
1. Training program.
2. Training schedules (weekly).
3. Breeding cards.
4. Pigeon breeding record.
5. Pigeon flight record.
6. Pigeon pedigree record.
7. Monthly loft report.
(*b*) Records made out properly.
(*c*) Entries legible.
(*d*) Files of retained records maintained.
(12) *Loft personnel.*
(*a*) Personnel assigned.
(*b*) Qualifications and experience.
(*c*) Duties performed.
(*d*) Technical training conducted.
(*e*) Interest in specialty.
(*f*) Understudies trained.
(13) *Transportation.*
(*a*) Means of transportation used in connection with training flights.
(*b*) Adequacy of transportation for training flights.
(14) *Miscellaneous.*
(*a*) Use made of pigeons and personnel for instructing other troops.
(*b*) Value of loft activities to the post.
(*c*) Interest developed in pigeon communication among local personnel.

31. Inspection.—*a.* Before beginning the inspection, the previous report of inspection is obtained from the post commander and carefully studied. It is returned upon completion of the inspection.

b. The inspector, by personal investigation and inspection, checks all of the important points relating to pigeon activities. He makes such inquiries pertaining to use of pigeons for signal communication training as he may deem necessary and consistent with his duty, regulations, and orders. He completes all duties required by regulations.

c. The inspector bears in mind that the primary purpose of the normal inspection is to promote efficiency and economy and that he

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should render all possible assistance in acquainting the loft personnel with measures that are considered necessary to correct any condition that is not satisfactory.

32. Inspection report.—*a.* The formal report of inspection includes all defects and deficiencies noted and all changes and recommendations considered necessary by the inspector.

b. The report is in the following form:

Subject: Iinspection of Signal Corps Pigeon Loft at (camp, post, or station).

To:

Last inspection made _____ (Date) by _____ (Name)

This inspection made _____ (Date) by _____ (Name)

under authority of _____ (Source, date, etc.)

(1) Stationary lofts.
(2) Mobile lofts.
(3) Automotive lofts.
(4) Experimental lofts.
(5) Care of Pigeons.
(6) Training of Pigeons.
(7) Breeding of Pigeons.
(8) Feed.
(9) Storeroom.
(10) Equipment.
(11) Records.
(12) Loft personnel.
(13) Transportation.
(14) Miscellaneous.

_____ (Signature)

c. Each of the above main subdivision headings is covered by a concise discussion of the conditions pertaining thereto, and any recommendations the inspector considers necessary or desirable. A satisfactory condition will be mentioned as will also an unsatisfactory condition.

d. If certain types of lofts are not on hand at the post, the number and title of the heading is given and a statement made that none are on hand, for example:

(4) Experimental lofts: None.

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SECTION V

TRAINING

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33. General.—*a.* The officer in charge of a pigeon loft or number of lofts will prepare a training program for each loft which will serve as a general guide for the conduct of the activities of the loft. (See AR 105–200.)

b. Based on the approved training program for the loft, weekly training schedules will be prepared for the guidance of the pigeoneer in charge of the loft.

34. Personnel.—*a. Qualifications for pigeoneer.*—A pigeoneer should possess certain qualifications and personal traits of character. The minimum training specifications are set forth in TM 11–450 (now published as TM 2260–5), and are repeated here:

(1) *Skill.*—That required for a basic private plus—

(*a*) Ability to care for and properly feed pigeons.

(*b*) Ability to hold properly, attach messages to, and release pigeons.

(*c*) Ability to instruct others in (*a*) and (*b*) above.

(2) *Knowledge.*—That required for a basic private plus a thorough knowledge of capabilities, limitations, and habits of homing pigeons.

(3) *Personal traits.*—A pigeoneer who is boisterous and of a turbulent nature tends to frighten and upset pigeons and thus reduce their effectiveness. The successful pigeoneer should possess—

(*a*) *Dependability.*—He should be regular and prompt in all his duties.

(*b*) *Kindness.*—Kind to obtain the confidence of the pigeons.

(*c*) *Patience.*—Patient as time and repeated effort are required in training pigeons.

(*d*) *Neatness.*—Neat in order to maintain a sanitary and attractive loft for the pigeons.

(*e*) *Firmness.*—Firm to enforce discipline in the handling of pigeons.

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(*f*) *Power of accurate observation.*—Able to observe details readily and accurately in order to note and learn characteristics of individual pigeons in the loft.

b. Basic training.—Personnel selected for training as pigeoneers should be qualified as basic privates prior to commencement of pigeoneer instruction. Skill and knowledge qualifications prescribed for a pigeoneer will be based on AR 105–200, FM 24–5, and on this manual.

c. Advanced training.—Pigeoneers qualified in the basic training prescribed in *b* above and who possess the ability to further their training as pigeoneers will be selected for advanced training with a view to selection as specialists or noncommissioned officers. Advanced training will include—

(1) *Skill.*—(*a*) Ability to manage a training loft to include the training of both young and old pigeons.

(*b*) Ability to manage a breeding loft and supervise the breeding activities after the breeding schedules have been prepared.

(*c*) Ability to instruct others in (*a*) and (*b*) above.

(2) *Knowledge.*—A thorough knowledge of loft management; feeding, training, and breeding of pigeons; and the employment of pigeon communication as set forth in the publications listed in *b* above.

35. Pigeon training.—All pigeons except those specifically reserved for breeding purposes undergo training continuously from the time they are hatched until the ages of 7 to 10 years. Pigeons are trained in fixed or mobile lofts for both day and night flying. The methods employed in each type of training are somewhat different.

36. Objectives.—*a. Day lofts.*—The training objective in day lofts is to develop a stock of pigeons capable during daylight hours of—

(1) Homing to their mobile or fixed loft when single tossed and carrying a message, from a point of release 40 miles distant under average weather conditions within 60 minutes. Single tossing consists of releasing pigeons one at a time so that each is out of sight, prior to the release of the next.

(2) Homing to their mobile or fixed loft when single tossed and carrying a message after 60 hours confinement in a basket or other similar container.

(3) Settling to their mobile loft when the latter is moved to a new location in a minimum of time, not over 70 hours.

(4) Homing to their mobile loft when single tossed after the loft has been moved to a new location within 3 miles of the old location along a line of loft displacement (see par. 37*b* (4)), subsequent to the removal of the pigeons therefrom.

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b. Night lofts.—The training objective in night lofts is to develop a stock of pigeons capable during hours of darkness of—

(1) Homing to their mobile or fixed loft at night when single tossed and carrying a message from a point of release 15 miles distant within 30 minutes under average weather conditions.

(2) Homing to their mobile or fixed loft when single tossed and carrying a message after 30 hours confinement in basket or other similar container.

(3) Settling to their mobile loft when moved to a new location in a minimum of time, not over 70 hours.

(4) Homing to their mobile loft when single tossed after the loft has been moved to a new location within one mile of the old location, along the line of loft displacement, subsequent to the removal of the birds therefrom.

37. Methods, day lofts.—*a. Fixed.*—(1) The training of a pigeon begins in the nest compartment. The first step in training the youngster is to teach it to understand that the can rattle means food. (See par. 20*c* (5).) This training is continued during its stay in the breeding loft and during the early stages of the second step.

(2) The second step is the training of the youngster to trap.

(*a*) It is essential that pigeons trap immediately upon return from any flight, in order that messages carried by them can be delivered with the least possible delay.

(*b*) Successful trapping requires the services of two pigeoneers. The young are taken from the nest when 4 weeks old and placed in a compartment by themselves. They are then old enough to care for themselves, but not yet strong enough to fly. Place them on the lighting board. Have the assistant shake the can rattle inside the loft. The youngster, which has been kept hungry, hears the can rattle, knows by this time it means food, and will pass through the trap to receive food. If it hesitates on the lighting board, force it with a long thin pole or whip to pass through the trap. Use the pole or whip with sufficient force to make the pigeon afraid of it but at the same time be careful not to injure the pigeon. Some pigeoneers successfully train their pigeons to trap without the use of the pole or whip. After the first ones enter the trap, those remaining on the lighting board will enter quickly, as they can observe the others eating inside the loft and will usually be hungry themselves. The assistant inside the loft scatters only a few grains as each youngster is trapped. Take care to prevent the first ones trapped from getting too much to eat. All the youngsters should be

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kept partially hungry so that they can be induced to trap readily in response to the can rattle in succeeding exercises.

(*c*) When new birds are received who do not know how to trap, place a settling cage over the lighting board and proceed with the new birds as with the youngsters above.

(*d*) Begin the first trapping exercises in the morning after the loft has been cleaned, the next about 2 P. M., and the third about one hour before sunset. At the beginning of the third day, teach the pigeons to fly from the hand to the lighting board and require them to trap as before. First hold the pigeons only a few feet away from the lighting board; as they become stronger on the wing, gradually increase this distance until the point of launching is at the maximum distance from which the loft is visible, not to exceed 1 mile. Continue these trapping exercises three times daily for the first week. At the end of this period all the pigeons should have been trained to trap readily. In case there are one or more obstinate or unruly pigeons that do not trap quickly, place them in a nest compartment for a period of two feedings, allow them water but no food, and permit them to observe the other pigeons as the latter are being fed. Then repeat the trapping exercises. This method will usually correct their tardiness.

(*e*) Adjust the trap to permit entry into, but not exit from, the loft.

(*f*) Always station a pigeoneer at the loft to be on the lookout for return of pigeons after a liberation and have him give a few grains of food to each returning pigeon as a reward.

(3) Upon completion of training in (2) (*d*) above pigeons should be ready to receive advanced training.

(4) During the second week require the pigeons to fly to their loft from a distance of 1 mile, gradually increasing the distance to 5 miles by the last 2 days of the week. In each of the training flights toss the pigeons singly. Work to train the young pigeons to trap promptly on their return to the loft. It is best for the assistant to liberate the pigeons, and for the pigeoneer in charge to remain at the loft to hasten the trapping, and to reward each returning pigeon with a few grains of feed mixture. If the weather conditions are not suitable for training flights, open the trap and allow the pigeons their liberation for a loft flight (flight in the vicinity of the loft) as a substitute. In this case permit them to leave the loft of their own free will and to remain outside for about 30 minutes before being called in by means of the can rattle.

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(5) During the third week's training attach message holders before the morning training flight and remove them when the pigeons trap after their last flight for the day. The training flights should be continued twice a day, with gradually increasing distances of 5 to 10 miles. It is important to release the pigeons from different points of the compass so that they will learn to fly in all directions and encounter the different wind conditions.

(6) During the fourth week the procedure is the same as for the previous week except that the distances of the training flights are gradually increased from 10 to 20 miles; on the last day hold but one training flight for a distance of 30 miles.

(7) During the fifth week hold one training flight a day gradually increasing the distance up to 50 miles. Pigeons that have been trained to home from distances of 50 miles may be safely liberated from distances of 75 to 100 miles subsequently.

(8) During the sixth and subsequent weeks the pigeon's training consists of exercise or training flights over such distances as will keep the pigeon in good physical condition until the moulting starts. During the time pigeons are moulting the amount of work is reduced.

(9) When a new shipment of homing pigeons is received at a loft, it is necessary to confine the pigeons in the loft to acquaint them with their new surroundings. In addition they should be allowed to spend their time in the aviary (see par. 16) or settling cage where they can observe and familiarize themselves with the surrounding country. During the confinement, spend a great deal of time taming the new birds. Allow them their own section of the loft and permit individual birds to select their own perches. See that they are not disturbed, and talk to them constantly in order that they may soon feel at home. In general, youngsters strong enough to fly should be confined about 3 days. Old birds may require confinement up to 6 days to settle. At the expiration of this time the traps of the loft should be opened and the pigeons allowed to go out on their own initiative. The best time for this first liberation is late in the afternoon before the pigeons have had their last feed of the day. Dark or overcast days are ideal. After 20 to 30 minutes of liberation the pigeons are called by the can rattle and given their evening food. On this liberation do not drive the pigeons out of the loft. If they are driven they will fly wildly, without knowledge of the country, will lose themselves and fail to return. The normal young pigeon, on being permitted to go through the trap for the first time of its own free will, will perch on the lighting board or roof of the loft and probably make a few short flights in

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the air, returning to the roof of the loft after each one, venturing farther and farther away at each succeeding flight.

(10) On the second day of liberation the trap is opened at about noon, the pigeons are allowed to go out of their own free will, remaining outside for perhaps 30 minutes, then they are called in by the can rattle and given a very slight amount of food. Give them another flight of 30 minutes terminating just before the evening feeding time.

(11) On the third day open the trap before the pigeons are fed in the morning and allow them to go out of their own free will and fly around the loft for perhaps 30 minutes; after which call them in by the can rattle, and give them the regular amount of food. In the afternoon, about 4 or 5 o'clock, depending upon weather conditions allow them another flight.

(12) Never feed a pigeon anywhere except inside the loft. Never allow a pigeon to alight upon the ground, a tree, or a building; only on the lighting board or roof of the loft. After pigeons have been thoroughly settled and trained to a loft, do not allow them to remain an indefinite time on the roof of the loft; always call them in by the can rattle and give them a few grains of food. Never liberate a young pigeon in a heavy fog, mist, rain, or snow, for an exercise flight. It serves no useful purpose, and may result in the loss of the pigeon.

(13) Never take out a pigeon in poor condition for a flight. In the case of healthy pigeons when taken out always liberate them and allow a flight home, reducing the distance if necessary. Never carry back a pigeon that is able to fly to the loft.

(14) After the first molt the young pigeons may be expected to show their first desire to mate. If it is not desired to let them mate at this time the cock and female pigeons should be separated and placed in separate compartments or lofts. The nest boxes should be closed.

(15) Where pigeons are mated they are continued in training, even after eggs are laid. If it is contemplated that the eggs will be destroyed both cock and hen may be taken out on the same practice flight. If the eggs are to be hatched and the squeakers developed, only one of the mates is sent out on any one flight, the other remaining with the nest. Incidentally, the homing tendency of the pigeon is heightened during the breeding season by his domestic desires, and his reliability is increased thereby.

b. Mobile.—(1) *General.*—(*a*) The training methods for mobile lofts have changed greatly within the past few years. It has been

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demonstrated that greater success may be obtained through kindness and a dependence on the intelligence of the homing pigeon than by the method of control through hunger.

(*b*) *Mobile loft design.*

1. Markings.—The roof of each mobile loft should be painted in distinctive colors to distinguish it from other lofts and trailers in the vicinity.

2. Settling cage.—A small settling cage to fit over the lighting board should be provided. A large cage extending onto the roof of the loft is not necessary.

3. Nests.—The nests in the mobile loft should be placed at the back, away from the door and the trap, so that the pigeoneer on entering the loft will not disturb nesting birds. Each nest should be equipped with a door so that it may be closed when not in use.

4. Perches.—Pigeons like to perch as high as possible. For this reason boards with dividing partitions should be placed along the full length of both sides of the loft, and about one foot from the ceiling. Additional perches should be provided so that there will be at least ten percent more perch space than actually needed when the loft is fully stocked.

5. Floor.—The loft should be equipped so that the maximum floor space is kept clear.

(*c*) *Stocking the loft.*—The loft should be initially stocked with youngsters from reliable day fliers or stock pairs. These youngsters should be placed in the loft when 28 days old, and broken to the loft and the trap.

(*d*) *Taming the birds.*—The basis for successful operation of a mobile loft is high degree of taming, and a close association between the birds and the pigeoneer caring for them. The birds should be made to feel that the pigeoneer belongs to the loft. To accomplish this the pigeoneer should spend as much time as possible with the birds. He should do as much work in the loft as he can, such as the posting of records, and repair of equipment, and when not otherwise occupied should spend the balance of his time with the birds. Mobile loft birds should be so tame that they will not hesitate to light on the arms and shoulders of the pigeoneer. In addition, the pigeoneer should assist the birds in every way possible by settling disputes over nests and perches, assisting birds to find nests, and in general trying to make the birds perfectly contented and happy.

(2) *Preliminary training.*—(*a*) *Location of loft.*—If possible, the loft should be located away from other lofts and trailers so that the

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youngsters will not be attracted away from their home loft. For preliminary training the loft should be located in an open field.

(*b*) *First flights.*—When the youngsters are strong enough to fly, usually after three or four days in the loft, they should be given their first training tosses. These first few tosses should be from points very near to the loft, starting from a point about ten yards from the trap. The birds should be released one at a time, the best method being to place each bird on the basket and permitting him to take off at will. These short single toss flights are repeated each morning, noon, and evening for the first week, with gradually increasing distances as the birds grow stronger.

(3) *First mobile training.*—After the first week of flying actual mobile loft training is started. After the birds have been basketed for their morning toss on the first day the loft is moved about twenty yards before the birds are released. The birds are given one or two other flights during the same day with the loft in this new position. On the second morning, after the birds have been basketed, the loft is again moved, this time about 40 yards. This process is repeated every morning, the distance for each move of the loft being gradually increased, until at the end of about two weeks the loft is being moved distances of approximately ½ mile. During this period, distances of training flights are increased from flights in the vicinity of the loft to flights of about five miles as indicated in paragraph 37*a*.

(4) *Advanced training.*—(*a*) After youngsters have successfully completed the above training, advanced training is begun. Advantage is taken at this time of the directional characteristics of the bird in finding its loft. A straight line is selected, ten or more miles in length, along which are points suitable for locating the loft. Each morning after the birds are basketed the loft is displaced either forward or to the rear along this line. Initially, loft displacement does not exceed ½ mile, and is gradually increased to 3 miles. For this training birds are given two flights daily, one in the morning and one in the afternoon; the first flight at 5 miles distance, and subsequent flights with increasing distances up to 50 miles. The birds are always single tossed. They are released at points in prolongation with the line of displacement of the loft.

(*b*) When training is conducted in combat areas a line along which the loft is to be displaced is usually selected so as to be at right angles to the front. Birds properly trained may in many cases find their loft after it has been displaced as much as 10 miles along this line.

(*c*) Since mobile lofts in field use must be camouflaged, pigeons should be trained to find their loft when it is under trees, against

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buildings, or covered with brush. During advanced training the loft initially is only partially concealed, and as training progresses the loft is completely camouflaged. During this training it is essential that a pigeoneer be at the loft to call the birds from the air in case they should fly over the loft without seeing it.

(5) *Long distance movement of the loft.*—When the loft has been moved to a completely new theater of operation, the birds must be broken to the new loft location and trained to a new line of loft displacement. Immediately after arrival in the new location a settling cage is placed over the lighting board and the birds permitted free access to it. Within 24 hours the pigeons begin to make training flights. In the preliminary steps one pigeoneer releases the pigeons, singly, within hearing distance of the loft and in a direction from which the birds will be normally expected to fly with messages. The other pigeoneer calls to them so that they can find their way back to the loft. Each succeeding flight is made at a greater distance than the last but in the same direction, three training flights a day being normal. On the third day the loft is moved about 100 yards along the selected line. Birds which have been properly trained in accordance with (3) and (4) above, normally require only a few short movements of the loft to fix the line.

(6) Under normal circumstances a mobile loft should be selfsupporting. Necessary replacements of pigeons should be bred in the mobile loft itself. During a move of the loft birds should be placed in baskets: however, hens on eggs and squeakers must be left in the nest boxes, and care must be taken not to injure the eggs or the squeakers. During operations where birds are being trained or are in constant use and it is necessary to use some of the hens sitting on eggs, or with squeakers, those eggs or squeakers are removed to other sitting hens, the eggs first being marked so that they may be restored to the proper hen upon the latter's return. If time and loft space are available it is advisable to give youngsters from stationary lofts preliminary mobile loft training, as outlined in (2) and (3) above, in order to create a reserve of mobile loft birds for use in emergency. These birds may then be returned to their original loft after mobile training, and continue their fixed loft training. They retain their mobile loft training and may be used in a mobile loft when necessary. Old birds should never be transferred from the original mobile loft to which they were trained.

38. Methods, night lofts.—*a. Fixed.*—(1) *General.*—The training of pigeons for night flying is relatively recent, and must still be

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considered somewhat experimental. However the training methods presented have proved quite successful, and should be followed. It is anticipated that changes in method may occur in the future.

(2) *The night loft.*—(*a*) *Location.*—The night loft should be situated as far as possible from wires, trees, or other eminences which might injure the birds in flight.

(*b*) *Shutters.*—Since night flying pigeons are trained and fed at night they must be given an opportunity to rest during the day. Doors and windows on a night loft are equipped with shutters that exclude light without cutting off circulation of air.

(*c*) *Lights.*—When birds are working at night the interior of the loft is brightly illuminated. A light is placed above the trap in such a position that it shines faintly on the lighting board. No lights should be placed on the outside of the night loft.

(*d*) *Lighting board.*—The lighting board is larger than that normally used for day birds. It should have a length of at least five feet, and extend out from the loft at least three feet. Aluminum paint should be used on the lighting board to make it faintly luminous; the board should be repainted frequently.

(3) *Stocking the night loft.*—Continued breeding of night flying pigeons has not demonstrated that the ability to home at night is transmitted to the youngsters. In fact night birds, because of their changed mode of living, are seldom in fit condition for breeding, and will usually produce youngsters that are below the desired physical standard. For these reasons it is best to stock a night loft with youngsters from proved day fliers.

(4) *Preliminary training.*—Youngsters should be placed in the night loft when 28 days old. Breaking them to the loft and the trap should be done in the day time. During the first two weeks the schedule given for day birds is followed. (See par. 37*a*.)

(5) *Exercise.*—During the third week the single toss day flights are continued as for day birds. In addition, the youngsters should be exercised late in the afternoon so that they learn to trap to the loft at dusk. They should be fed at this time by artificial light. *Night birds should never be released for exercise after dark.* To drive birds from a lighted loft out into the darkness is certain to result in injuries and losses. The youngsters continue their exercising progressively later, being released late in the daylight but so that their flying and arrival is made in the dusk and darkness of night. After the fifth week they should be ready for night training.

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(6) *Preliminary night training.*—Even after years of experience pigeons never lose their fear of flying at night. This fact is most important in the training of youngsters. The pigeoneer must bear in mind that the bird he tosses into the dark is always very frightened. If youngsters are given their first night training tosses in the evening, after dark, they are confused and frightened, and are likely to fly blindly into wires and trees, or settle to the ground and await daylight. Youngsters that settle to the ground on the first few night flights will do so on subsequent flights, and seldom develop into reliable night fliers. Morning tosses in the darkness just before dawn have proved by far the most successful in the training of night fliers. Youngsters tossed in the morning before dawn are as confused and frightened as if tossed in the evening; however, before they can stray very far from the loft area, or attempt to settle to the ground, it becomes light and they can easily find their way to the loft. Continued tosses in the morning before daylight will impress upon the bird that, even though he is confused or lost, all he need do is remain in the air long enough and it eventually will grow sufficiently light for him to find his way home. Having thus overcome his initial fear, his natural instinct and intelligence will come to his aid, and he attempts to find his way home through the darkness. After a number of successful flights to the loft in the darkness before dawn the pigeon will have gained enough confidence so that he may be safely tossed in the evening, or at any time during the night.

(7) *Direction training.*—Night flying pigeons are very directional, and cannot be successfully flown from all directions. A bird flying well from the south will usually not be reliable if released from the north. A few pigeons will fly equally well from all directions, but these must be considered exceptions. For this reason night birds should be trained only for the direction from which they will be used. To attempt to deviate from this course by more than 45° is certain to reduce greatly the effectiveness of the pigeon. If it is expected that night birds will be required for flights from two directions, for example, from the south and from the west, two teams of pigeons should be trained, one for each direction.

(8) *Altitude training.*—Night birds that fly close to the ground upon release cannot be considered reliable messengers even though they do return to the loft in good time. Such birds are almost certain to fly eventually into wires or trees and injure themselves. Therefore a well-trained night bird should immediately ascend to a

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high altitude upon release, and make his flight to the loft at such altitude. The following method has been very successful in teaching young night birds to ascend at once upon release, and to remain high in the air. A field of high corn, cane, or reeds in the vicinity of the loft is selected. On a clear, moonlight night the youngsters are gently tossed one at a time into the tops of this vegetation. The pigeons will not be flying fast enough to injure themselves. However, they become so frightened in attempting to fly clear that upon freeing themselves they rise straight into the air to a high altitude. Two or three such tosses are generally sufficient to teach youngsters to climb rapidly to a great height immediately upon release. This training is not necessary in the case of youngsters which are exercised with old night birds, and who learn to follow the latter to high altitudes. Birds for this training must have successfully completed the training indicated in (6) above.

(9) *Releasing.*—Night birds should always be *forcibly* tossed into the air when released at night. Night birds should never be group tossed, or released from a basket. An open spot as far as possible from wires, trees, and buildings should be selected for the release of night birds. These points should be stressed in the training of handling and using personnel.

(10) *Advanced training.*—(*a*) Continuous training flights are necessary to keep night fliers in condition for use. Each bird should be given at least two training flights a week. Night birds should be trained for flights up to 30 miles, with the average flight being made at distances of from 15 to 20 miles.

(*b*) Night birds should be trained to carry message holders by frequently attaching them to the birds during training flights.

(11) *Care and daily routine.*—To give night birds sufficient rest the shutters on loft doors and windows should be kept closed in the morning, and the pigeoneers should not enter the loft or disturb the birds in any way. At about 11 AM the shutters should be opened, and the birds allowed to go into the aviary while the loft is being cleaned. After the loft is cleaned the birds should be lightly fed, and then provided a bath if the weather is favorable. The shutters are then closed. If pigeons are not being sent out for training or signal communication flights they should be exercised in the evening. The evening meal should be at about 9 PM at which time the birds should be given all the feed they can clean up.

(12) *Flight records.*—The keeping of the Pigeon Flight Record is of extreme importance in preparing night birds for communication

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flights. In addition to the usual notes posted in the flight record, the failure of a bird to home at night and the weather conditions during a flight should be listed. Accurately kept records will readily show that certain birds home poorly from some directions but do better from others. Such birds should be then trained only over the course on which they make the best returns. By noting the weather the records will show that some birds fly well in rain and fog while the speed of others is greatly reduced. This information enables the pigeoneer to supply units with reliable birds for varying conditions.

b. Mobile.—(1) *General.*—The displacement of mobile night lofts during the absence of birds is feasible only where it is permissible to illuminate the top of the loft or place other distinguishing lights on the loft, which the bird in flight can see and recognize. If the use of lights is prohibited, as may be the case in combat areas, it is impracticable to displace the night loft. In such case, the birds are settled to a particular location of the night loft, and it is not moved during their absence.

(2) *Training.*—If distinguishing lights are permitted on a mobile night loft the training of the birds is similar to that for mobile day lofts except that training flights are given at night at much reduced distances. The distances of loft displacements are correspondingly reduced. Where no outside lights are permitted, the training for mobile night lofts is the same as for fixed night lofts.

39. Methods, long-distance flying.—*a. General.*—(1) Flights of 100 miles or more are called long-distance flights. Specially bred and trained pigeons are developed for such flights, and are employed mostly by the Air Corps. Such pigeons should have pedigrees showing that they have been bred from proven long-distance flyers. Mature, long-distance pigeons are reliable up to 300 miles in one day, but where greater distances are required a careful selection must be made for those capable of greater distances. Pigeons with special care can continue to fly long distances until they are from 7 to 10 years of age.

(2) *Personnel.*—A careful selection must be made of pigeoneers to train and care for a loft of long-distance pigeons. The pigeoneer should have had several years of experience in other lofts, and have a marked aptitude for judging flying birds. He should be given training under another pigeoneer experienced in long-distance work until he has demonstrated his ability to train and select long-distance pigeons for himself. He must keep pigeon records meticulously,

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culling and eliminating unsatisfactory stock, and developing finer stock as he deems best. A qualified pigeoneer should not be required to maintain a loft containing over 50 long-distance pigeons. With these he should become intimately familiar, learning their individual characteristics in detail. He should cater to their peculiarities to bring out their best abilities; as for example, upon the return of a bird from a long-distance flight the pigeoneer assists the exhausted bird to his own perch or nest, dislodging any intruder if necessary. He should be allowed considerable latitude in exercising his initiative and developing his own ideas in regard to his birds.

b. Training of youngsters.—Training of long-distance pigeons is done from fixed lofts. Youngsters selected for long-distance flying should be broken to the loft and taught to trap in the same manner as birds being trained for normal day or night flying. After these preliminary steps are completed, the birds are given exercise flights, normally two each day. As soon as the birds can fly easily for periods of 40 to 60 minutes they are ready to begin long-distance training. If the birds are molting these training flights should not begin until the heaviest part of the molt is completed. Once training is started it should be concentrated. Birds are given 4 or 5 training flights a week starting at about 3 miles, with gradually increasing distances until at the end of one month they have flown 100 miles successfully. Pigeons that have received this training and are in proper physical condition now can be flown from distances of 150 and 200 miles. Youngsters should not normally be flown more than 200 miles. During the winter season, or during periods when pigeons are not required for long-distance flights, they should be kept in condition by daily exercise flights and by conditioning flights of 20 to 30 miles about once every two weeks.

c. Training of yearlings.—After the pigeons are a year old they are mated for the first time. During this period they are trained in the same manner as youngsters, beginning with 3-mile flights, working up to 100-mile flights. They are now ready for long-distance flights up to 300 miles. Yearlings should not normally be flown over 300 miles. They are kept in condition with 40- to 60-mile flights twice a week.

d. Training of old birds.—This training is exactly the same as for yearlings except that after the old birds have made 100 miles flights they are ready for distances up to 500 and 600 miles. They are kept in condition similarly as are yearlings.

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SECTION VI

BREEDING

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40. Sex.—It is difficult without experience to determine the sex of a pigeon. It can be done frequently by observation but sometimes the physical characteristics of the cock and the hen are so similar that in order to distinguish between them accurately it becomes necessary to observe their actions when together. The final absolute test is to watch the pigeons when the cock is driving. Driving is the act of the cock chasing and picking at the neck of a hen to drive her to the nest so she will lay the eggs. Such actions as dragging the tail cannot be relied upon for the hen will sometimes do this. The main points of difference between the cock and the hen are—

a. The cock usually has a broad skull while the hen's skull is inclined to be narrow.

b. The cock's shoulders are broader than the hen's.

c. The cock's vent bones are closer together than the hen's.

d. The cock's eyes are bright and fiery, while the hen's are rather mild. An experienced pigeoneer can usually distinguish the sex of a pigeon by the expression in its eye.

e. The bloom or sheen around the cock's neck is usually brighter than on the hen.

f. The cock's coo is coarse, full, and round while the hen's is sharp.

41. Mating.—*a. General.*—Pigeons are monogamous, the domestic relations being more like that of civilized human families than of many other birds and animals. Unless forcibly separated, a cock will keep the same mate and the same nest throughout his life. The desire to mate is a natural instinct and since pigeons are monogamous, mating for breeding purposes can be controlled. If left to their own inclinations, pigeons will mate at the age of from four to nine months, but for breeding purposes mating should not be permitted until pigeons are one year old.

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b. For breeding purposes.—The aim is to produce youngsters who are at least equal in ability if not superior to either of their parents. Such youngsters are obtained by selecting as parents birds whose pedigrees, flying records, physical qualities, and temperament indicate that they will probably produce youngsters of the required type.

42. Selection of stock.—Stock is selected for breeding at a loft by or with the advice of the pigeon expert in charge of breeding activities at that loft. The points which follow are very important in this selection and good results may be expected if they are properly and carefully followed.

a. Pedigree.—The pedigree for at least two generations back is used to determine probable qualities of future youngsters since it shows family, strain, and the kind of flying in which the birds excel, as well as the performance of other youngsters produced by the same parent. For example, when breeding for long-distance flyers, parents should always be selected whose pedigrees indicate that they and their previous youngsters have been outstanding long-distance flyers. When birds are being bred for pigeon communication purposes (normally short distances) parents whose pedigrees show that they have been outstanding short-distance flyers (sprinters) should be selected.

b. Flying records.—Only birds with excellent flying records should be mated for breeding. Dependability is as important as speed.

c. Physical qualities.—Pigeons selected for breeding should be in good health and as nearly perfect physically as possible. If a pigeon has ever had a serious injury or has been very ill it is unsuited for breeding purposes. The following physical qualities are desirable:

(1) *Color.*—The color of the feathers should be deep and rich. Two very light birds or birds showing a large amount of white, particularly in the flights should not be mated because light pigeons are easy prey for hawks. Birds with any white flights should not be bred for offspring to be used in the tropics because in the tropics white flights will not last an entire season.

(2) *Feathers.*—The feathers should be of good quality. The flights, which are most important, should be heavy, wide, and should overlap when the wing is extended, showing no gaps between flights. Birds with very thin flights should not be bred. Body feathers should be soft and deep.

(3) *Eye.*—The eye must be bright and clear.

(4) *Size.*—The pigeon should be slightly larger than average when birds are bred for pigeon communication purposes. An

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average size hen is mated with a cock slightly larger than average. The mating of large birds with small ones should be avoided.

d. Temperament.—Birds being mated to breed stock for pigeon communication should not be high-strung but should be calm and easygoing. Under no circumstances should two nervous or excitable birds be mated. This is more important for mobile lofts than for fixed lofts.

43. Line breeding.—If at any time a single pigeon stands out as superior, stock should be developed from this exceptionally good one by line breeding. Line breeding is breeding from pigeons of the same or closely related parentage. Successful line breeding requires an experienced pigeoneer, and the mating of champions which are physically perfect. Except for line breeding, inbreeding should not be practiced. The aim is to reproduce the old birds in the young, amplifying their good qualities and minimizing those that are bad. The most successful method of line breeding is as follows:

a. Select the pair to be mated and allow them to mate as indicated in paragraph 45*c*.

b. From their young, mate the best hen with her father and the best cock with his mother the following season.

c. From the young produced by the mating in *b* above, mate the best hen with her grandfather and the best cock with his grandmother.

d. If, in any generation, there are no outstanding hens or cocks, disregard that generation as far as breeding is concerned.

44. Nests.—*a.* Pigeon nests are earthen bowls kept free from vermin by an occasional dipping in an antiseptic solution, preferably 10 percent phenol. Cocks display a keen desire to use the same nest compartment each time they are mated or if moved to a different loft, the nest compartment in the same relative position as the one occupied in the former loft. If not permitted to do this the cock will fight the occupant of the compartment. Therefore, consult previous breeding records and assign nest compartments carefully. Hens do not show this trait but accept a change in compartments and follow their mates.

b. Tobacco stems are supplied for nest material, except in damp climates where broom straw, which does not absorb moisture, is substituted therefor. Broom straw is used rather than ordinary straw because it is solid and offers no refuge for lice and other vermin as does hollow straw. Put a handful of sawdust or wood shavings in the nest bowl to prevent the breaking of eggs, keep the tobacco stems or broom straw in a rack on the floor of the loft, and allow the pigeons to arrange such of the material as they desire to suit their fancy.

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45. Control.—The method of control given below is simple, natural, successful, and requires minimum handling of the birds.

a. Time.—The best youngsters are obtained when mating is accomplished during the months of February, March, and April. If possible, all breeding for the year should be done during these months. Normally each pair should not raise more than one nest of youngsters each season. If it is desired that any eggs be not hatched, remove them and replace them with glass nest eggs.

b. Before mating.—Prior to mating, separate all of the hens from all of the cocks in order to break up any attachments they may have already formed.

c. During mating.—When it is desired to begin breeding, remove all pigeons from the loft compartment except the cock to be mated, close all nest compartments except the one assigned to him, place him in the nest, and leave him there. He will leave and enter the nest several times and, if the nest is properly assigned (par. 44*a*), will quickly accept it as his own. Next, place the hen to be mated with this cock on the floor of the loft. She will remain there until the cock calls her to come up to the nest. He will do this after he has watched her a few minutes. When the hen enters the nest the birds may be considered mated. Close the nest compartment and proceed with other pairs in the same manner.

d. After mating.—For the first few days after mating open only alternate nest compartments to minimize the danger of birds entering the wrong nest and fighting.

e. Following season.—A pair producing outstanding youngsters should continue to mate with each other each season. Mated pairs producing unsatisfactory youngsters should be broken up and each pigeon remated with another bird.

46. Laying.—From 5 to 10 days after nesting has been started, the first egg is laid between 2 and 4 pm. The second egg is laid 44 hours later, between 10 am and 12 noon. As a rule, the parent birds do not hover the first egg until after the second is laid, so that the squeakers, on hatching, will have an equal chance. If they start to hover at the time the first egg is laid, the young one from the first laid egg will be much larger than the other. Fertility is indicated if the egg becomes a light bluish color after 10 days, and if, when held up to the sun's rays, it shows blood lines. As a rule, the squeaker from the first egg laid is the male pigeon, and from the second egg the female pigeon, although sometimes there are two of the same sex raised in the same nest. Do not destroy the first pair of eggs; allow them to hatch and raise the youngsters. Tests have proved that the

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hatch from the first pair of eggs is often the best of the whole year's breeding.

47. Hatching and feeding.—*a.* The incubation period is from 17 to 18 days, the hen pigeon usually sitting from 4 PM to 10 AM daily, the male pigeon the remainder of the day. It has been the experience of some pigeoneers that breeding pigeons do their best flying after they have been sitting from 5 to 15 days. Care should be taken that both parent birds are not flown at the same time, but that one remains to sit on the eggs or be with young pigeons during the absence of the other.

b. The young pigeons are fed a curd or milk secreted by both parent pigeons the first 5 to 7 days, after which time they are given grain. This feeding of curd or milk is done by either parent pigeon who drinks water, permits the young pigeon to stick its bill down his throat, and then forces the food up into the young one's throat.

48. Identification.—The identification record of the pigeon is started when the hen lays the egg. This record, up until the time that the youngster leaves the nest compartment, is kept on a breeding card. (See par. 25.) For identification purposes, each pigeon is banded when 5 to 7 days old. (See par. 26.)

49. Culling.—To keep the stock in a loft up to standard, it is necessary to cull severely. Unless all birds are needed, cull (destroy) those which do not meet physical requirements for breeding. In addition, destroy those which show a definite lack of intelligence, or which do not perform up to the average. Normally about 30 percent of the young bred in any one season are under the physical standard and should be culled to keep the stock of that loft from degenerating. In addition, 20 to 30 percent of the stock may be expected to be lost as a result of disease or injury, during flight, and further culling because of substandard performance.

SECTION VII

DISEASES AND REMEDIES

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50. General.—Certain diseases attack pigeons which, if not detected immediately, are likely to sweep through the loft destroying or ruining most of the birds. Normal preventative methods will usually safely protect pigeons from diseases. It is necessary, therefore, that the pigeoneer be able to detect, correctly diagnose, and treat the more common pigeon diseases in addition to taking preventative measures.

51. Prevention of disease.—*a. Sanitation.*—Sanitation is the most import factor in the prevention of disease. The following rules must be strictly adhered to:

(1) Keep loft clean and dry.

(2) Keep drinking fountain clean, and the water free from pollution.

(3) Quarantine new stock until certain that all birds are free from disease.

(4) Never permit stray pigeons, wild birds, or mice to enter the loft.

(5) Never feed pigeons on a dirty floor, as most of the more serious diseases are transmitted through the droppings.

(6) Deeply bury or burn diseased birds that have been destroyed.

(7) Immediately isolate birds showing any signs of sickness.

(8) Men handling diseased birds must disinfect their hands before handling other birds.

(9) A loft contaminated by disease must be thoroughly cleaned and disinfected.

b. Loft condition.—Pigeons must never be crowded in the loft. Under normal conditions there should be about fifteen cubic feet of air for each bird in the loft. It is best to subdivide large lofts into smaller compartments for better control, and ease of observation of the birds. Direct drafts should be eliminated. Windows should be so placed as to admit a maximum amount of sunlight.

c. Nutrition.—A proper diet and regular feeding hours are essential, as a feed mixture deficient in certain elements or too rich in others causes some diseases.

52. Control of diseases.—*a.* Pigeons showing any signs of sickness must be segregated immediately. If possible a veterinarian experienced in poultry diseases should be consulted.

b. Because mobile lofts would not normally have a place for the isolation and treatment of diseased birds, and because of the extreme danger of contaminating the rest of the flock, it is usually advisable to destroy and burn or bury all diseased birds.

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c. In any case of disease the loft must be thoroughly cleaned and disinfected. Such disinfecting destroys the germs of the disease, and also the mites and lice which may be carriers. It is necessary to remove all sand, droppings, and litter from the loft before disinfecting. Disinfectants are best applied with a brush or spray, and should cover every part of the loft including the ceiling and loft fixtures. An excellent disinfectant for pigeon lofts is a whitewash composed of the following:

2½ pounds slaked lime.
1 pound lye (sodium hydroxide).
5½ gallons water.

This whitewash must be used as soon as prepared, as it deteriorates rapidly when exposed.

53. Indications of sickness.—*a.* The following are common indications of sickness:

(1) Refusing to eat.

(2) Dull, watery eyes.

(3) A droopy appearance with feathers ruffled, and showing no desire to move.

(4) Green, watery droppings. If such droppings are noted in the loft all birds should be watched until the sick one is detected.

b. The easiest and best way to detect sick pigeons is to observe the birds at feeding time. The pigeoneer should also examine all birds as they are being basketed for training tosses.

54. Diseases.—*a. Cholera.*—A highly infectious and fatal disease which may attack pigeons of any age.

(1) *Cause.*—Cholera is caused by a germ which multiplies rapidly in the blood stream. Great numbers of these germs are present in the droppings of infected birds through which the disease can rapidly spread to the entire flock.

(2) *Symptoms.*—Pigeons become droopy, and develop a greenish diarrhea. They will eat little or nothing, but are extremely thirsty. Breathing is loud and difficult. The bird rapidly becomes too weak to stand, and usually dies within about three days.

(3) *Treatment.*—There is no treatment for cholera. Diseased birds must be destroyed, and the bodies deeply buried or burned. The loft must be thoroughly disinfected. One-third teaspoon of potassium permanganate to the gallon should be added to the drinking water to prevent spread of the disease through it. All birds must be closely observed following an attack of cholera, and any showing the least signs of sickness must be immediately isolated.

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b. Diphtheria (*Canker, Pox*).—The cheesy growths in the mouth, and the pox warts on head and legs of pigeons are symptoms of this disease.

(1) *Cause.*—This infectious disease is usually introduced into a loft by outside birds. Diphtheria is spread through the droppings, and through the drinking water.

(2) *Symptoms.*—Canker growths develop as tough, cheesy nodules in the mouth, and sometimes in the eye and ear; they often attain the size of peas. Pox looks like small warts, and may develop anywhere on the body, though the pox growths are most common on the feet and legs. Young birds are particularly subject to diphtheria in the summer and early fall, and should be examined frequently at this time as canker growths develop very rapidly, and if not detected will get out of hand.

(3) *Treatment.*—Badly diseased birds should be destroyed. For mildly infected birds remove all cheesy growths from the mouth, and paint with argyrol, or with a tincture of equal parts of ferric chloride and glycerin, if the growth is on the eyelid or ear, open and clean out the cheesy mass, then paint with argyrol. Usually a false membrane will grow over the cleaned tissue; this must be removed and the area again treated as above. Daily painting with the ferric chloride and glycerin will usually clear up the mouth in a few days. Daily painting with iodine will check the growth of pox warts on the body. These warts soon dry, and fall off. Pigeons once cured are immune to diphtheria. Following an outbreak of this disease the loft must be cleaned and disinfected, and the drinking water protected by the addition of one-third teaspoon of potassium permanganate to the gallon of water.

c. Gout.—A condition resulting from uric acid in the blood.

(1) *Cause.*—Gout is caused by a feed too rich in proteins, and by lack of exercise.

(2) *Symptoms.*—The joints of the wing and feet swell, and are very painful. These swellings gradually change to a tumor like growth, and may eventually break emitting a yellowish pus. The bird slowly loses weight, becomes weaker, and shows signs of diarrhea.

(3) *Treatment.*—The protein content of the feed mixture must be reduced. Green foods should be fed daily. A 00 capsule of Epsom salts at the start of treatment is helpful.

d. Roup (*infectious coryza, cold*).—An infectious and contagious disease that will quickly spread to all birds in the loft if not checked.

(1) *Cause.*—Roup is caused by the germ Hemophilus gallinarum.

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(2) *Symptoms.*—There is a yellowish mucous discharge from the mouth, usually having an offensive odor, and a growth in the mouth distinguishable from canker in that the growth is not solid, nor firmly attached to the tissue underneath. Roup sometimes spreads to the eyes, causing swelling, and even closing of the lids. Breathing is difficult, and a pronounced coughing and gasping is heard. The bird loses appetite.

(3) *Treatment.*—Birds severely affected should be destroyed. Place birds to be treated in a warm room where the body temperature of the pigeon can be slightly raised. Clean the mucous discharge from the mouth and wash with a solution of one teaspoonful of common salt to a quart of warm water. Following the salt wash, rewash with a solution consisting of one ounce boric acid to one quart of water. Use a fifteen percent solution of argyrol for treatment of affected eyes. Repeat the above treatment twice daily. Loft must be thoroughly cleaned and disinfected following an outbreak of roup. Protect drinking water by the addition of one-third teaspoon of potassium permanganate to the gallon of water.

e. Tuberculosis.—An infectious disease that usually develops so slowly that it cannot be detected until it is in the advanced stage.

(1) *Cause.*—Tuberculosis is usually introduced into the loft by strays or wild birds. The disease is spread through the droppings.

(2) *Symptoms.*—This disease is usually noted in old birds. The flesh of the breast gradually wastes away, and the bird becomes very weak. Droopiness, diarrhea, and lameness of the wings or legs usually accompanies this disease.

(3) *Treatment.*—There is no treatment for tuberculosis. The bird should be destroyed. In cases where it is believed that a bird may have this disease a veterinarian should be called in to perform tests on the live bird, or make a post-mortem. If the disease is tuberculosis the entire flock must be tested, and all those with the disease immediately destroyed, even though the latter seem to be in perfect health. It is necessary to thoroughly clean and disinfect the loft following the discovery of this disease.

f. Thrush.—An infectious disease of the mouth and crop of young pigeons. This disease is most commonly found in youngsters still in the nest.

(1) *Cause.*—Thrush is caused by a fungus.

(2) *Symptoms.*—A slimy grayish or yellowish mucous discharge is present in the mouth. The bird refuses to eat, or in the case of a youngster in the nest the parent birds refuse to feed him.

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(3) *Treatment.*—Remove the youngster from the loft or from the nest. Clean the mucous discharge from the mouth and throat, and paint with a tincture of equal parts of ferric chloride and glycerin. If the case does not clear quickly it may be due to the crop being affected in which case the crop should be flushed with a two percent solution of boric acid.

g. Going light.—This is not a disease in itself, but a symptom or result of some disease. Any pigeon showing loss of flesh should be isolated and observed until the affecting disease is determined.

h. One-eye cold.—(1) *Cause.*—Exposure to dampness and drafts.

(2) *Symptoms.*—There is a watery discharge from the eye, and the surrounding membranes are frequently swollen. The bird should be closely examined, as it may have roup.

(3) *Treatment.*—Place the bird in a warm room. Treat the eye daily with one drop of tincture of metaphin.

i. Diarrhea.—This is not usually a distinct disease, but the result of some other disease.

(1) *Cause.*—Diarrhea can be caused by colds, incorrect diet, impure drinking water, or a run down condition due to exposure and overwork. Young birds often have diarrhea as a result of eating excessive amounts of grit.

(2) *Symptoms.*—The droppings are green and watery.

(3) *Treatment.*—The sick bird should be isolated, and observed to determine if it has some other disease. The feeding of rice will usually check the condition if it is caused by diet or drinking water. Give the bird a 00 capsule of Epsom salts, and feed very lightly for the first three days of treatment.

j. Sour crop.—(1) *Cause.*—Sour crop is caused by damp or mouldy grain, lack of grit, or impure water.

(2) *Symptoms.*—The pigeon will sit with feathers ruffled. A greenish diarrhea usually accompanies sour crop. On examination the crop is found to be hard and distended.

(3) *Treatment.*—Hold the bird with the head down, and gently press on the crop until all feed has been removed. Flush out the crop with a solution of four teaspoons of bicarbonate of soda to a quart of warm water. Give the bird a 00 capsule of Epsom salts on first day of treatment. Feed a light mixture consisting mostly of rice, millet, kaffir corn, and other small seeds. Repeat the cleaning and flushing of the crop daily if necessary until this condition clears.

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k. Pigeon malaria.—This is a rare disease. It is more prevalent in tropical lofts.

(1) *Cause.*—Caused by a germ carried by the pigeon fly.

(2) *Symptoms.*—This disease is difficult to detect. It may be occasionally detected by a paleness of the flesh of the breast which results from anemia caused by the disease. The bird usually dies about three days after being infected. A post-mortem diagnosis by a competent veterinarian is necessary to determine the cause.

(3) *Treatment.*—There is no treatment for pigeon malaria. The dead bird should be buried deeply or burned. Other birds of the loft should be carefully inspected for the presence of the fly, and all pigeons dusted with sodium fluoride powder. The loft should be sprayed with the disinfectant described in paragraph 52*c*.

55. Vermin.—*a. Lice and mites.*—(1) The common vermin found on pigeons are the feather louse and the red mite. The feather louse lives on the feathers and does not directly injure the pigeons. The red mite is a bloodsucker, and usually attacks the pigeon at the vent. It annoys the birds, and is a carrier of disease.

(2) *Treatment.*—All lofts should be thoroughly disinfected at least once a year. All birds should be dipped once each year. The following dip is recommended:

1 gallon warm water.
1 tablespoon sodium fluoride.
½ cup soap flakes (Ivory or Lux).

Select a warm, sunny day for dipping, and start early enough so that all birds will have sufficient time to get thoroughly dry before dark. Fill a pail with the solution, and dip one bird at a time. First spread one wing and dip it up to the body, moving it in the solution until all feathers are thoroughly saturated. Repeat with the other wing. Spread the tail and dip. Next dip the body, ruffling the feathers around the tail and vent so that the solution penetrates thorougly. Complete the process by pinching the nostrils and quickly dipping the head. Let the dipped bird sit in the sun for a few hours to dry. Do not give dipped birds a bath, or permit them to fly in rain for three days after dipping. Where individual birds are to be treated for lice a dusting with sodium fluoride powder will kill all vermin.

b. Pigeon fly.—During the past few years a pigeon fly which is very common in tropical lofts has been found in increasing numbers in northern lofts. This pest is about the size of a common house fly. It is a bloodsucker, and because of its size an attack by any

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number of these may be very damaging to the pigeon. These pigeon flies are also the carriers of pigeon malaria, and for this reason alone a close watch should be kept for them.

c. Worms.—Occasionally certain worm parasites are found in the intestines of pigeons, which may cause serious disability. Worms may be detected and treated by a competent veterinarian. Since these worms must be taken into the system as eggs or larvae, dry, clean lofts guard against them.

56. Treatment of injuries.—*a. Cuts and wounds.*—In case of cuts and wounds first remove any foreign matter in and around the wound. ~~Paint the injured flesh with tincture of iodine.~~ In case of large cuts or tears in the skin it is necessary to sew the skin together. Because the skin of a pigeon is loose and somewhat free from the flesh it is a simple matter to sew it without serious discomfort to the pigeon. Use a needle and silk thread that have been dipped in iodine. Be particularly careful that no feathers or dirt are left in the cut.

b. Broken legs.—A broken leg is one of the most common accidents suffered by pigeons. However if the broken bones are properly set they will heal in three weeks and the leg will be as strong as before the break. If the following method of splinting a broken leg is used it is not necessary to retire the pigeon from service while the leg is healing.

(1) Cut a piece from a tin can about ¼-inch wide and 6 inches long. Wrap this piece carefully with adhesive tape.

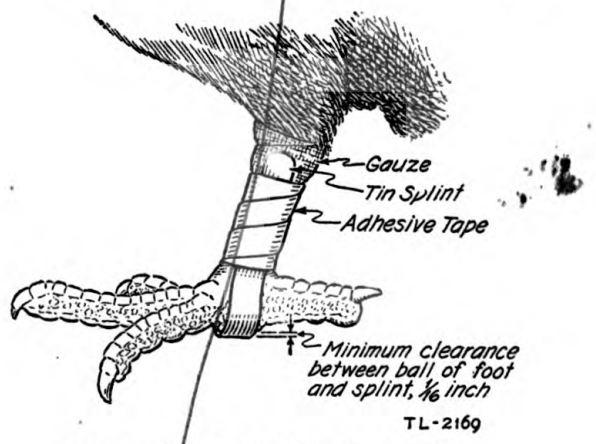

FIGURE 19.—Splint for broken leg.

(2) Shape this piece of tin into a **U** with a slightly bulbous base. (See fig. 19.)

(3) Set the broken bone, and wrap the leg with a thin covering of gauze or cotton.

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(4) Place the tin splint on the leg, U down, so that the arms of the splint are along the sides of the leg, the three front toes extended from the front of the U, and the great rear toe from the rear of the U. A most important point is that the bottom of the splint does not touch the ball of the foot, but must have about $\frac{1}{16}$-inch clearance.

(5) Bind the splint to the leg firmly with adhesive tape. Such a splint gives the bird an artificial foot to walk on without placing any weight on the break. The bird will become accustomed to the splint in a couple of days and may safely be used for flying.

c. Damaged flight feathers.—Pigeons being used for field service frequently suffer from bent or broken flight feathers as a result of improper handling. If such feathers are plucked a bad gap is left in the wing, and it may take some weeks before the bird is again ready for service. Bent or broken flights can be repaired by the following methods, and will be almost as strong as the original feathers:

(1) If flights are badly bent they can usually be brought back to the original form by steaming the quill, and by gently shaping the feather.

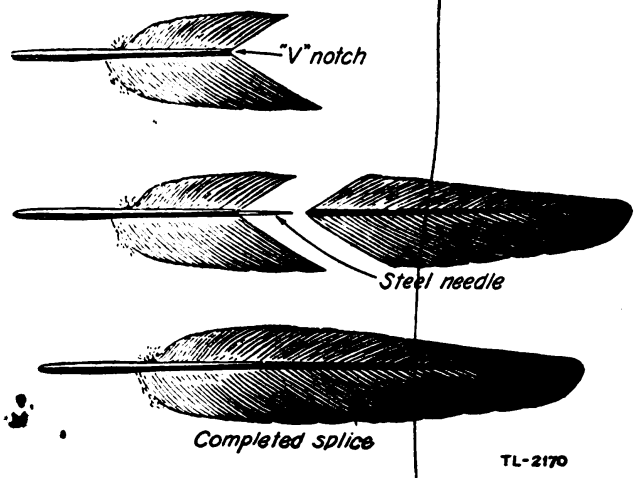

FIGURE 20.—Splicing a flight.

(2) If a flight is broken it may be repaired in the following manner. Cut a V notch in the quill of the flight below the break, as indicated in figure 20, being careful that the barbs or webbing extends up to the side of the notch. Pluck a same numbered flight of the same general outline and size from a stock bird or other bird not being used (for example, if a number seven primary flight is broken, pluck a similar number seven primary from a stock bird). Cut this plucked flight so that when its point is fitted into the notch of the orig-

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inal flight the feather will have the same proportions as the original unbroken flight. Insert about half the length of a steel needle through the axis of the first quill, by means of pliers. Place a small amount of waterproof cement in the notch. Carefully force the plucked portion onto the needle, making sure that the latter remains in the axis of the quill. The two portions should fit so that when the ends of the webbing are gently stroked until they adhere, the feather will give the appearance of the original flight except for the notch. This spliced flight should remain serviceable until it is replaced by the next molt. If the break occurs in the hollow part of the lower quill below the webbing, it may be impracticable to use a steel needle for the splice. In such case a splinter of wood is shaved so as to fit accurately into the hollow of both flight portions. This wooden needle is covered with waterproof cement before insertion and splicing.

57. Medicines.—*a.* The following medicines will be found useful in the treatment of disease:

(1) Argyrol, tincture, 15 percent solution; for treatment of throat during diphtheria and for roup infected eyes.

(2) Bicarbonate of soda, mixed 4 teaspoons to quart of water; for flushing crop in case of sour crop.

(3) Boric acid, 1 ounce to the quart of water; for mouth wash for roup; 2 percent solution for flushing crop for thrush.

(4) Epsom salts; one "00" capsule as a laxative.

(5) Ferric chloride and glycerin, tincture of equal parts; for treatment of throat for thrush.

(6) Iodine, tincture; for treatment of wounds, and checking growth of pox warts.

(7) Lye (sodium hydroxide), used in whitewash as a disinfectant.

(8) Metaphin, tincture, eye strength; for treatment of eyes infected by one-eye cold.

(9) Potassium permanganate, mixed one-third teaspoon to gallon of water to guard against spread of disease through the drinking water.

(10) Salt, common, one teaspoon to quart of water; for mouth wash for roup.

(11) Slacked lime; used in a disinfecting whitewash.

(12) Soap flakes; for use in dip to destroy lice and mites.

(13) Sodium fluoride; used for dusting to destroy lice, and in dip.

b. The following materials should be kept on hand for use in treatment of diseased and injured birds:

(1) Cotton.

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(2) Eye droppers.
(3) Gauze.
(4) Capsules, "00" gelatine.
(5) Knife, one with small sharp blade.
(6) Measuring glass with ounce graduations.
(7) Needles, small steel.
(8) Scissors.
(9) Tape, adhesive.
(10) Teaspoon.
(11) ~~Thread, white silk.~~

[A. G. 062.11 (6-4-40).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

Official:
E. S. ADAMS,
Major General,
The Adjutant General.

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